

PHILOSOPHICAL
TRANSACTIONS.

Giving some

ACCOUNT

OF THE

Present Undertakings, Studies and Labours

OF THE

INGENIOUS.

In many

Considerable Parts of the World.

VOL. XXV. For the Years 1706 and 1707.

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MDCCVIII.

TO HIS
ROYAL HIGHNESS
THE
PRINCE,

This Twenty Fifth Volume
OF
Philosophical Transactions

Is most humbly Dedicated,

B Y

His Most Dutiful,

A N D

Most Obedient Servant,

HANS SLOANE,
Soc. Reg. Secr.

PHILOSOPHICAL TRANSACTIONS.

For the Months of January, February, and March, 1705.

THE CONTENTS.

- I. *A Letter from Mr Ralph Thoresby, F. R. S. to Dr Hans Sloane, R. S. Secr. concerning some Roman Inscriptions found at York, proving that the Ninth Legion sometime resided there.*
- II. *De Quadrupedibus Philippenſibus Tractat. a Reverendo Georg. Joſ. Camel. tranſmiſſus Jacobo Petiver, Pharmacop. & Societ. Regiæ Soc. Londini.*
- III. *Microſcopical Obſervations on the Seeds of ſeveral Eaſt-India Plants, by Mr Authony van Leeuwenhoek, F. R. S.*
- IV. *A Letter from the Reverend Mr Morton, A. M. and S. R. S. to Dr Hans Sloane, S. R. Secr. Containing a Relation of River and other Shells digg'd up, together with various Vegetable Bodies, in a Bituminous Marſhy Earth, near Mears-Aſhby in Northamptonſhire: With ſome Reflections thereupon: As alſo an Account of the Progreſs he has made in the Natural Hiſtory of Northamptonſhire.*
- V. *An account of a very large Tumour in the fore-part of the Neck, in which was contain'd a Bony ſubſtance, &c. By Dr James Douglas.*
- VI. *Part of a Letter from the Reverend Mr W. Derham, F. R. S. concerning a Glade of Light obſerved in the Heavens.*
- VII. *An Account of an Experiment made before the Royal Society, touching the Proportion of the Weight of Air, to the Weight of a like Bulk of Water, without knowing the quantity of either. By Mr Fra. Hauksbee, F. R. S.*
- VIII. *An Experiment made at Greſham College, ſhewing that the ſeemingly ſpontaneous Aſcenſion of Water, in ſmall Tubes open at both ends, is the ſame in Vacuo as in the open Air. By Mr Fr. Hauksbee, F. R. S.*

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- I. *A Letter from Mr Ralph Thoresby, F. R. S. to Dr Hans Sloane, R. S. Secr. concerning some Roman Inscriptions found at York, proving that the Ninth Legion some time resided there.*

BY your very kind Letter I perceive how much I am obliged to the Society for so candid a reception of my poor Endeavours, which encourages me to transmit two *Roman* Inscriptions found at *York*, one very lately, the other several years ago, but no where yet taken notice of, tho it hath this very remarkable, That it is an undeniable Argument that the *Ninth* Legion was not only in *Britain*, which is rarely taken notice of, but that it resided at *York*; which was heretofore unknown. It is a Funeral Monument, whereupon, under the Statue (in *Basse-relieve*) of the Standard-bearer of the 9th Legion, is this Inscription.

L DVCCIVS

* Lubens voluit

* L. VOET. RVFI

-NVS. VIEN

SIGN. LEG. VIII.

AN. XXII. X.

Hic situs est.

H. S. E.

This Monument was found in *Trinity-yard* in *Mickle-gate* at *York*, and was happily rescued by my Honoured Friend *Dr Bryan Fairfax*, from the brutish Workman, who

who had broke it in the middle, and were going to make use of it for two *Throughs*, as they call them, in the Wall; but by that worthy Gentlemans direction it was placed upright, with the Inscription outwards. That this 9th Legion was in *Britain* in *Galba's* time, and that it was also *Hispaniensis*, appears from the very Learned Sir *Henry Savile's* Notes at the end of his Edition of *Tacitus*; but that it, as well as the VIth and the XXth, was also called *Victrix*, or that it resided at *York*, has not been observed before; and yet both are evident from this Inscription upon a *Roman* Brick found there.

[L E G. IX. VIC.]

This is also an Argument of the Peace these Parts enjoyed at that time, (possibly the latter end of *Severus's* Reign,) making Bricks, casting up Highways, &c. being the usual employment of Souldiers at such vacancies. The former Inscription is now removed to the Gardens of Sir *John Goodricks* at *Ribston*; the latter is in my possession.

Sir *Hen. Savile* was of opinion that this *Nona Hispaniensis* in *Britannia* was one of those established by *Tiberius*, *Caius*, or *Claudius*, or peradventure in the later times of *Augustus*; but however that it was certainly here in *Nero's* Reign, and that *Petius Cerealis* was then Lieutenant thereof is indisputably evident from *Tacitus*, (*lib. 14. cap. 10.*) who gives a lamentable account of the slaughter of seventy thousand Citizens and Contederates, by the enraged *Boudicea*, in which number was all the Foot of this ninth Legion: *Cerealis* with the Horse hardly escaping. I suppose it needless to add, that this Number is frequently by the *Romans* writ VIII as well as IX; for one that is but competently vers'd in their Coins or Inscriptions, cannot but have observed instances of both kinds; however, to prevent all mistakes, (it being near
ten

ten years since I saw this Monument) the Learned and Ingenious *Roger Gale*, Esq; was so kind as to send me a new Transcript; and I have by me also a third, lately taken by a grave Divine; all which agree that it is the IXth Legion, which is also confirm'd by the other Inscription upon the Brick, which was but lately found. I shall only add what an Ingenious Gentleman of *Oxford* writes, - because it relates to an Author I have not the opportunity to consult here, but is possibly in your Curious Library. "I am mightily pleased with the Inscriptions you sent me relating to the 9th Legion, there being now no room to doubt about the place of Residence, a thing which was unknown before; and for that reason, those who have written about the *Roman* Legions have said nothing about this, but leave us quite in the dark; only *Urfatus* [in his Book *de Notis Rom.*] does remark, that it must be somewhere in *Britain*, because *Tacitus* tells us, that when the Colony at *Camalodunum* was destroyed by *Boadicia*, *Petilius Cerealis*, Legate of the IXth Legion, came to their assistance; but yet he makes no mention of its being stiled *Viatrix*. This I receiv'd from Mr *Tho. Hearne* of *Edmund Hall*, from whom is expected a curious Edition of *Livy*.

Your Most Obliged and Obedient Servant,

Ralph Thoresby.

II. *De Quadrupedibus Philippensibus Tractat. a Reverendo Georg. Jos. Camel. transmissus Jacobo Petiver, Pharmacop. & Societ. Regiæ Soc. Londini.*

1. **C**ercopithecus *Luzonis* minimus. GAZOPHYL. Natur. &c. Tab. 13. Fig. XI. GAZ. NAT. Tab. 13. Fig. XI.

Magu vel Booot *Indorum*. Cercopithecus *est Luzonis* minimus. *Magnitudinem* quæ *Glyris* est, *Icon* exprimit, & communiter adhuc minor, & gracilior est. *Facies* Leonina; *Oculi* rubri, magni, rotundi ut *Noctuæ*, nunquam, aut rarò conniventes: *Aures* pellucidæ, depiles: *Pilus* *Murium* luteolus, aut aureolus: *Gesticulationes* lepidæ ut *Simiæ*: *Cauda*, & *Pedes* posteriores longitudinis reliqui corporis: Rarò interdiu aparet, hinc eum cœcutire putant. *Progreditur* ordinariâ saltando, & retrorsum, vel in obliquum velocius, quam antrosum. *Narrant vivere* Carbone &c, sed falsum est, cum *Ficu Indica* & alijs vescatur *Fructibus*. Incedens cum prole, quam ad ventrem. Plantæ volubilis *Pamago* funiculis alligatam fugientem gerit. *Pamago* verò *Indi* ad recidivas commendant.

2. Cato-Simius *volans* GAZOPH. NAT. Tab. 9. fig. 8. & Aët. Philosoph. No 277. p. 1065. seu, S. B. 6. 1. GAZ. NAT. Tab. 9. Fig. 8.

Colago & *Cagvang* *Bysaiani*. *Gagna* *Pampangi* & *Tagali* vocant Cato-Simium volantem. *Magnitudinis* ordinariæ est *Felis*, formæ corporis *Simij*, sed gracilioris. A *Capite* in *Caudam* trium spithamarum longus, ad fæmora sesquispithamam latus, ad brachia duas spithamas latus, à pedibus posterioribus, ad pedes anteriores trium spithamarum, à pede anteriori dextro ad sinistram trium pariter

spithamarum, a pede posteriori dextro ad finistrum duarum spithamarum, Venter palmam latus, membranæ ad ventrem spithameæ. Verum invenitur ut affirmant in *Provincia Pampanga* magnitudinis, *Sinenfis*, & portatilis umbraculi solis, seu latitudinis sex spithamarum. *Pilus* coloris subfusce murini in dorso, quibusdam albis floccellis variegatus, suavissimus, qualis est *Pellis* Germanis *Fech* vocata, in corpore longior, in membranis brevior: Ad ventrem longior, & ex albo rufescens, in membranis verò brevior, ejusdem coloris rara, & mollis lanugo. A capite ad brachia à brachijs ad pedes, à pedibus ad caudam usque latæ expanduntur membranæ, quibus expansis gravi volatu, non nisi ex summo unius arboris, in alterius caudicis medium transfertur, ubi dein volatu interpolari saltuatim summum petit. *Faciem* habet *Simie*, aures rotundas planas, pilis carentes, in quovis pedum anteriorum & posteriorum quinos compressos, Leoninos & acutissime hamatos ungues. *Pellis* quam transmitto *Maris* erat, *Femella* ad Ventrem binos habet quavis sacculos, in quibus satuli ubera fugientes hærent. Quibus vescatur ignotum, probabile est fructibus vivere, cum communiter in arboribus degat.

3. Cabug vel Panicqui. *Vespertilio* est magnitudinis *Galinae*, vescus. Orgyæ unius ab explicato alæ fine ad alterum invenit, *Petrus de S. Buenaventura*.

4. Cabugcabug s. Cabag vel Talibata. *Vespertilio* est parvus, ordinarius.

5. Colalapnit s. Calapnit. *Vespertilio* est communis, sed cristatus & duplicatis auribus.

6. Cornu *Rhinocerotis*, Hispan. Cuerno de Abada, *Unicornio*, & *Licornio*, Indis *Sinis* Sayguka. Affertur de *Siam* & *India*, majus & repandum seu recurvum, ex nare affervo albidum, cubitale ad imum spithamæ latum, ad medium diametri sesquispithamei, solidum & ponderosissimum. *Alia* parva & *Sina* afferuntur quæ sunt ex dorsi gibbo. *Annulos* ex Cornu, & ungula contra aeris

commendant contagium, ut illos ex cauda *Testudinis Marine*, & *Dumbaga*, *Nucem Vomica* & *Asam fœtidam*. Ungulam, Sanguinem & Pellem ad Febres, Astma & Epilepsiam laudant.

7. *Bubalus Luzon*. *Indis* Avang, *Sinis* suygu i. e. Vacca aquatica *Hispan*. Carabao.

Vox tenuis, quâ potius balat, quam mugit: *Pilus* paucus, rarus, brevis, cinereo-terreus: *Corpus Buffalo Ungarico* compar: *Cornua* ingentia, non teretia, sed subplana, undatim aspera, coloris nativi, lateratim expansa, quandoq; ab extremo unius ad alterius sesquiorgyialia: *Cauda* brevis & forè depilis: *Domesticus* & *Sylvester*, qui ferocissimus magis nigricans & pilosus. *Carne* vescuntur utriusque *Sine*, *Indi*, *Æthiopes*. Calidissimum est *Animal*, temporis plus sub aqua, aut luto sepultum jacere gaudens, quam subdio vagari. Inimicitia gerit *Crocodilo* quem non formidat. *Cinera Cornuum* Sp. Vino subacta, utuntur *Indi* pro contrectatione spasmo correptorum.

8. *Gadia* s. *Garia*. *Elephas*. Abundat ijs *Insula Iolò*.

9. *Amo*, *Cercopithecus barbati*, *Hispan*. *Sambos*. Magnitudine *Pueri* decennis, *Indis* resistentes. *Puellas* & *Indas* adultas infestantes. *Vifus* est *Mindanaï* duobus pedibus insistens *Homine* altior.

10. *Baculao*. *Cercopithecus Magnitudinis Canis*.

11. *Mananir*. *Cercopithecus Magnus*, *Canibus* resistens.

12. *Mufang*, *Diniririsan*, *Dingalong* & *Singarong* est *Catus Zibethinus*. Non gerit *Zibethum* in *Vesicula* conclusum ut *J. Schroder*, asserit, sed in concavitate, aut rima medium duarum viarum occupante. Ultra *3ij*. una vice nunquam eximitur, si bene curetur, a maturis *Palantinis* & *Piscibus* abundanter faginetur, quavis tertia die *3i* *Zibethi* dare solet. Verùm hujates *Indi* labori supersedentes, *Catos* decipulis captos communiter interrimunt, ut *Zibethum* colligant. *Zibethum* rancidum aut corruptum *Succo Limoniorum* & *Sale* lotum, soliq; expositum restituitur. Invenitur in *Cato Zibethino* species *Lapidis Bezoar*. *Zibethum Diris* vocant.

13. Lampog. *Catus* est ferus, Sylvester & Montanus.

14. Cachori *vecant* Moschi Animal in *Igbabao*. Moschum *Castoli*. Moschi animal *Fele* minus, *pilo* durior quasi setaceo subrufo aut subfuscô. Corpus longiusculum, protensam Caput, Aures *Murinae*: Locus Moschi medius Venter, ubi congeritur in Excrescentia Ovi *Columbini* magnitudinis, nunc aut interijt ob reiteratas pluviarum creberrimarum inundationes, aut non facile reperitur ob sylvescentium montium inaccessibiles recessus.

15. Alalacsin. *Sciurus* est *Luzonis*, Europæo minor, vivissimus, coloris aureoli, quandoq; albissimi, cicuratur, *Glyrium* & *Murium* inimicissimus.

16. Cervos *Luzonis* nemora alunt plurimos, & inter hos totaliter albos, habet & albos *Cercopithecus*, *Sciuros*, *Psyttacos* & *Testudines marinas albas*. Cervos & *Aves Calaos* (vid. Fig. 6. Tab. 28. GAZ. NAT.) *Insula Zebu* non alit, & si inferantur emoriuntur. Cervos ex albo & subrufo eleganter picturatos mittit *Insula Iolo*; Cervos *unicornes* reperiri afferunt necdum vidi, quamvis Corniculum ex horum uno, dono oblatum asservem.

Lapidem ex Corde Cervi habui, quem D. Wilhelmo ten Rhine cum aliis *Kamilliis* misit. Lapidem Bezoartici passim eximuntur, sed nullius pretii, aut effectus in Medicina.

17. Bot. *Luzonis*, vel *Mongus*, in India *Bicho de Palma*, *Bicho de Pulo Condore* & *Chani* est C. Clusii Exot. p. 112. Fig. ex quo *Nirembergius* pingit p. 172. c. 32. *Mustela Africana*, *Sciuri* species.

18. Cocle. *Mus* est *Araneus*. Moschum redolens.

19. Daga. *Mus domesticus*.

20. *Mus Campestris*.

21. *Mus Montanus*, *Manbarag* magnitudinis *Nephrendis*, vescus.

22. Cavat. *Musculus minimus*, *Spicas Orizæ* arridens; nec culmos frangens.

23. *Glires domestici* & montani.

24. Vilic. *Talpa*. Hisp. *Tepo*.

25. Ababa. *Aper brevipes*.

26. Porci

GAZ. NAT.
Tab. 28.
Fig. 6.

Clus. Exot.
p. 112. Nic-
semb. 172.
c. 32.

26. *Porci* item species *pigmaei*, feri, cursu velocissimi.

27. *Bayong* s. *Pagil*. *Aper montanus*.

28. *Babuy*. *Sus domestica*.

Lapides Porcis exemptos asservo.

29. Ex *Vesica*. *Pendentem* 3i & 3v, coloris cinereo pallidi, constantem ex *Lamellis*. Pellit *Urinam* & *Calculum*.

30. Ex *Auxungia*. *Sphærico*-compressum, durisculum exalbidum, *Usus* ut fabulantur ad bonum *Corpori* habitum.

31. Ex *Hepate*, coloris rufi, plano-inequalem biunciale.

32. *Ægagropilum Indis Anbal*, ferme pugno comparem; interne coloris *Cinamomei*, de foris quibusdam in partibus nigro, perpolito & cutaco tectum corrice, *Odoris Cyperei* quo in *Luzone* plerumq; pascuntur ut *Nuce Moschata*. Valet ad *Menses*, *Partum*, *Lochia* & *Urinas* cienda.

33. *Anvang*. *Buffalos* hujas, *Carabao* *Hisp. Corei* loti, siccati & pulverisati, pulvis nobile incrassans in *Diarrhea* & *Dysenteria*.

34. *Bulithos Vacinos*, magnitudine *Avellanarum* asservo 15, candidi sunt & silicini ex *Sphærico* lacunati & ut *Bezoartici* laminulati. *J. Alzina* refert habuisse, *Dulaci* & *Bezoar* modo sudorem provocasse. *Ægagropilas* majores plures habui.

35. *Lapides Bezoartici Mexicani* eximantur ex *Cervis*, prouti & *Campetani* ubi *Contrayerva* abundat. *Peruviani* ex *Vicunnis*, *Quanaco* & *Alce* ubi pariter *Contrayerva* invenitur. *Persici* seu *Indici Goncoldani* ex *Cercopithecis* & *Capris*. Ex *Capris* leves sunt sine nitore friabiles, coloris in viridem tendentis, saporis amari, formæ ovalis, magnitudinis variæ, constantes ex laminulis, minus læves aut politi. His mihi imposuerunt A. D. 1697. eos pro *Cercopithecorum* divendentes. Emeram No 144. pendentes omnes simul 361. Unciam 14. *Regalibus* argenteis *Hispanis*, erant autem omnes integri & ex his 12. Ovo *Gallinaceo* aut pares aut majores. 30 *Columbino* ovo majores. 46 ovo *Columbino* pare. 50 ovo *Columb.* minores. 12. *Nude*

Avellanae majores. Ex *Cercopithecis* nitidè perpoliti sunt, magis compacti, lapidei, & ponderosi quam sint *Caprearum*; constantes ex laminulis, subamari, coloris cinereè, vel viridiusculè, vel fuscè virentis, ex his dein emerant 323. Unciam 2 *Imperialibus* erant autem No 33. Magnitudinis ovi *Gallinacei* 4. Ovo *Columbino* majores 6. Ovo *Columb.* pares 4. *Oliva* supares 5. *Oliva* minores 11. *Teretes* pollicem crassi, biunciam & sesquiunciam longi 3. Horum 3i. *Macai* venditur 6 *Imperial.* *Goe* 3 *Imper.* & dimidio. *Meliapori* 7 vel 8 *Imp.* quorum 6 s. 7 unam pendet 3. Fragmentorum vero 3 *Imperial* 2. De reliquo pro magnitudine crescit *Æstimatio* & *Pretium*.

36. *Mexicani* & *Luzonici* coloris sunt dilutè terrei, & saporis nullius vix alicujus in Medicina effectus boni; Et hos *Officina Occidentales* vocant.

37. *Peruviani*, Coloris sunt ex viridi nigricantis, & hos *Orientales* vocant.

38. *Indi* & *Mauritani* *Lapides Bezoarticos* generari narrant ex repletionè & pabuli indigestione. Et sane facile est, ut ex indigestione multum tenacis ac viscosæ procreetur mucilaginis, & superveniente Sanguinis effervescencia, prædicta mucago violenter decocta, non solum magis ac magis glutinosa evadat, incrassetur ac inspissetur, sed & accidente aliquo sale petrificante & insolubilibus ac indigestibilibus (ut sunt Fructuum ossicula, *Lapilli*, Lignorum Fragmenta, argillacea, fibrorum herbarum, radicum corticum tormentum) implicata, impacta ac superinducta in *Lapides* usque indurescendo abeat. Nec improbabile, tunc malè affecta Animalia ex instinctu naturali, plantas depascere amaras, & una cum his *Contrayervam* & similia *Alexipharmica*, ita ut ex horum succo, tenaci illa viscositati commixto, *Lapidi Bezoartico* resultet, color subviridis, sapor amaricans & virtus *Alexipharmica*. Hinc *Lapides* ii qui in Animalibus Tabe consumptis, aut ut ferunt repletionè extinctis reperiuntur, plerumq; majores, aut si parvi numerosi sunt, nec non cæteris efficaciores censuntur.

Ita

Ita in Provincia sonora Mexici, in Cervo emortuo *Lucas Valentinus* Lapidem invenit 3v pendentem, qui 530 Imper. æstimatus fuit.

39. In *Jucatan*, Hispanus in Cervo tabe consumpto invenit 60 lapides, fermè omnes æquales, magnitudinis *Nucis Avellanae*. In Lapidibus contractis, Golcondanis ex *Capris* & *Cercopithecis* inveni: Ex tomentosis filamentis compactum globulum, odoris suavis, subruffum fibroso-tomentosum globum, saporis aciduli; Pulveri impactas Radicum fibrillas. Oblonga Lignorum, Corticum & fructuum aut foliorum pediculorum frustella. Lapides nigros, rufos, cinereos, duros & friabiles. Terræ argillaceæ rubentis & nativæ fragmina. Semen ni fallor Viticis. Semen trifore magnitudine *Ciceris* nucleo-putrente acido. Nucleum osse *Tamarindorum* potiozem. Os ferme unciale, nucleo *Dactylorum* simile, unifore, oleo scatens, in aliis pulveres varios.

40. *Valesius* ab *Arziniega*, *Bezohar* vocat legitimos in animalium ventriculis (*Hisp.* *Tripon*, *Quaxo* & *Buche*) inventos. 2 *Lachrymas Cervi*. 3. *Fistitios*, quos necdum vidi præter *Nichalao Manuchianos*, formæ variæ quos fragmentis componit, includendo integrum minorem, sed facile distinguuntur, quia non sunt laminulati. Alios idem componit globosos, sigillatos, ex variis Cordialibus & Cordiales vocat. Alii deferuntur *Goâ*, ovaes *Gaspar Antoniani*, pariter ex variis rebus compilati. An Lapides de *Goa Georgivi Batei*? Illi verò an ejusdem *Batei* Lapides *Contrayerva*.

41. *Hystrix*, Indis *Balatnamatinie*. Reperitur in Provincia *Caraga* magnitudinis *Porcelli* octomestris. Ex hac eximitur *Lapis Porcinus*, seu *Hystericus Malacensis*, *Hisp.* *Pieda de Puerco Spin.* *Ægagropilus* potius quam *Lapis* dicendus, constat enim ex tomento, fibrillis & materia friabili, subruffa amaricante & deoris quibusdam in partibus, cutaceis & subnigris quasi unguibus coopertus, ut in tribus quos vidi observavi. Nec laminulatus aut tunicatus neq; ponderosus, aut politus est ut *Bezoar*, sed levis & asperiufculus ut *Ægagropila*.

42. *Lapidem Hystericum Malacensem* vidi dein alium, ponderis 3v. emptum 150 *Imperial.* apretiatum vero 500 *Imper.* Orbicularis erat, læviusculus, coloris *Carneoli* pallescentis, quasi pellucidus, substantiæ solubilis, ad tactum linguæ mox acriusculè & summe amaricans. Hic *legitimus* esse videtur, de quibus (ut supra) Anno tibi scripti elapso, aut adulterini aut *Ægagropila*.

43. *Hyæna* Luzonis non odorata, seu *Leytensium* *Sarimao*, *Animal* est Putorio compar, & majus, sed dentibus instructum validissimis, longioribus & aduncis: His & unguibus *Apri*, aut *Damulæ* dorso sese tenacissime affigit, ibidemq; pertinaciter persistit, donec usq; *Aper* cursu lassatus, & doloris molestia defatigatus succumbat & pereat, & tunc vorat ad saturitatem. Dentes *Sarimao* quandoq; in *Apri* aut *Damulæ* dorso defixa reperiuntur, scilicet cum fortuito casu *Sirimao* relictis dentibus excutitur. Hos *Indi* superstitiose æstimare solent.

44. Lac vig *Boholanorum*. Speciem esse referunt *Lupi* ferocis, magnitudinis *Vituli*, Hominibus & Animalibus infesti. An Coyote *Mexicanorum*.

45. *Mustela Hisp.* Comadreja *German.* Wieseke.

46. *Mustela* sylvest. *Viverra*, s. *Furunculus*. *Hisp.* *Huron.* Germ. *Hamester*.

47. Putorius. *Hisp.* Guardunna. Germ. Istesel.

48. *Mures* quos in *Insula Mindoro* ex arborum putrescentibus foliis oriri ferunt, affirmant qui curiosè investigavère, non ex arborum foliis, sed ex *Arundinis vallatoræ* speciei, fructibus generari.

49. Alamid T. Lamiran P. Miro s. Milo *Bys* Cacomittle *Mex.* Species est *Martis*, coloris minùs fulvi quam sit *Europææ*, magnitudinis *Felis*, Os productum, Pedes breves, Cauda *Cati Zibetini* hujatis, sed longior. Vescitur, *Insectis*, *Muribus*, *Avibus*, quas intuitu examinare ferunt, *Gallinis*, *Fructibus* & *Pane*. Facile Cicur evadit, vorax est & inquietissimum.

III. *Microscopical Observations on the Seeds of several East-India Plants, by Mr Anthony van Leeuwenhoek, F. R. S.*

Delft in Holland, March 19. 1706.

To the Honourable the Members of the
Royal Society in London.

Honourable Gentlemen,

I Now take the Liberty of communicating to you these my following Observations——A certain ancient Surgeon, that is a great Collector of Foreign Curiosities, had entreated another Surgeon, for whom he had an esteem, that when he was in the *East Indies*, and discover'd in the Plants or Seeds of those Parts any particular operation or effect, that he would impart some of 'em to him, with an account of their said operation ; whereupon he had received from the *East Indies* the Seed of a Tree called *Emmane*, of which the Description and Operation is as follows——'Tis a Tree much about the bigness of an Elder Tree, and the Flower, the Scent and Figure of it is not very different, but the Branches are armed with Thorns——'Tis used inwardly by no body, excepting some Women, that, disagreeing with their Husbands, make use of it in order to kill themselves; it being consequently a certain Poyson ——When these Women have made such a Heathenish and Impious Resolution, they take half a handful of those Leaves, boyling
13 O them

them in Water, and rubbing in a certain Oyl which they call *Sinfelen*, and so drink or eat it up; half an hour after which they perceive a kind of Convulsion in their Head, and vomit or retch four or five times: Lastly, they lose their Sences, and foaming at the Mouth, they fret and speak like Fools or Mad men till they dye: So that it seems that the Poyson thickens the Humours or fluid parts of the Body, till the circulation of them quite ceases. Some end their lives in one, others in two or three days, according as they have taken more or less of those Leafs. So far proceeded the Description that the *East India* Surgeon gave of it——The abovemention'd Seed is mostly of a Triangular figure, and not above the breadth of $\frac{1}{2}$ of an inch where it is largest; I took a little of it and put into a clean Paper and bruised it with a Hammer, and after that into a little Glasse Viol, and poured some fair Rain Water upon it, till the Water stood half an inch above the Seed——After the Seed had been infused in the said Water some hours, I took a little of the Water and mixed it with my Blood, as it dropt from my Finger by the pricking of a Needle, and I immediately observed that the Blood was extreamly Coagulated, yea, more than I had ever seen it in my Life——But as Blood, when 'tis mixed with common Water, keeps its clear Red Colour, and a great many Globules, which are the cause of its redness, being dissolved in the Water, do so incorporate themselves therewith that you can distinguish none of them from the Water itself, which thereby acquires a fine Crimson Colour; the appearance was quite otherwise with the Blood that was mixed with the Seed Water, for the Particles or Globules thereof being Coagulated, did assume a Blackish or Dirty Colour: and so I observed a very great number of Blood Globules that were not Coagulated, they all lay like stiff Particles; neither could I perceive that one of them were dissolved, or united to the Water; so that not the least

redness that looked like Blood was communicated to the Water, neither did there break forth the least Air bubble out of that mingled Liquor——I took moreover a little of the said Water, that was inclinable to a reddish colour, and dropt some of it upon six several places on a Glass Plate, in order to observe what Salt Particles might be Coagulated in the exhaled Liquor——I observed in the said Liquor, most of which did evaporate, that besides the Salt Particles there remain'd a great deal of a Coagulated Matter, in which I could discover no figure. I perceived likewise abundance of exceeding small Salt Particles, which were mostly of an exact square figure, and some few were long squares, with four Right Angles; some of those Salt Particles were broad in the middle, and pointed at both ends; but where a great many of them were Coagulated together, their figures were irregular——I observed likewise, that where the Water had lain a little time together, it was not altogether exhaled, but left a Balsamous Matter behind it——I put some of the said Seed into Water, in order to soften the Skin of it, that I might Dissect it the easier; and having accordingly open'd several of them, I took out the Plant, in which, tho it was no bigger than a small grain of Sand, I could perceive two Leaves, and that part of it which was to be the Root and Body——It was moreover affirmed, that the Oyl of *Singelan* or *Singely*, is esteem'd a good softner, and given to lying-in Women, and other persons that are in pain, as also to Children, with or without other Ingredients.

The Seed, of which also I had a little, is about the bigness of the aforementioned Seed, but something longer——I had moreover some few Seeds named *Cansie*, of which this is the Description——This Seed is used by the *Mahometans*, being grownd small and infused in Water, which will make them as drunk as Wine does others: If a person that is not us'd to it should take but

10 or 20 grains, 'twould have the same effect as if they had drank 10 Bottles of Wine.

They say it makes them very stout and luxurious, but those that use it daily and too often, do bring themselves at last to 1 or 2 ounces; but then it will not have that effect, but rather the quite contrary, rendring them dull and doting, depriving them of their Memory together with the Appetite, and at last making them so lean, that they would have hardly any Flesh upon their Bones; and this is the use the *Moorish* Kings make of it, when they have a mind to be rid of their great Lords, whom they would make dye a lingering Death, they cause such a Drink to be made, into which they infuse also the Seeds of Poppies, and give it them twice a day to drink in the Prison, more or less, according as they have a mind to dispatch them sooner or later; insomuch that they shall live half a year or a whole year without knowing any thing of the matter. They call this Drink *Bosta*.

This Seed is little used by them in Physick, tho I doubt not that it might be excellently well apply'd; because it does not only imitate the effects of *Opium*, but also, if there be not too much of it us'd at a time, it has the same operation as the best Wine: So much for the Description of this Seed called *Cancie*.—— This Seed is about the bigness of Hempseed, and has likewise such a hard Skin, so that one would be apt to take it for it.—— I took some of the last mention'd Seeds and stripped the hard Skins from them, and after that the thin Membrane that covers the Plant, and observed that the Matter which lay within was, as it appeared to me, nothing else but two Leafs and the Root and Body of a Plant; but when I separated those two Leafs, I found that they involved two other very small Leafs, long and slender, and of the figure of the former; and I also discover'd that these small Leafs had each of them four or five small ones standing out above one another. From whence

I con-

I concluded that the Tree or Plant which produces these Leaves is notched or indented——Afterwards I took some of the Hempseed, which I thought I had well Dissected, and of which, if my Memory fails me not, I have formerly given a Description to the Royal Society ; and examin'd the said Seed anew, to try whether I could discover any such small Leafs as I have found before in the Seed *Cancie*——Having then Dissected this our common Hempseed, I found that all the parts of it agreed with that of the abovemention'd Seed ; at first indeed when I took the small Leafs out of the larger in which they were folded, I could not see those Indented Parts abovemention'd, but when I separated the Leafs from each other, I could easily perceive them ; and then appear'd the two exceeding long Leafs lying so regularly within one another, that the Indented parts could not be discover'd——I bruised a few of these little *Cancie* Seeds, and pour'd Rain Water upon them, in order to discover whether there were any Salt Particles in the same, and tho I let some of the drops of this Water stand several days together, it did not at all evaporate, but there remain'd behind a thick moist Oily Matter, which I suppose was the cause that I could discover so few Salts to be Coagulated, and those that were there, that are hardly worth naming, were of the figure of those that are found in Wine Vinegar.

IV. *A Letter from the Reverend Mr Morton, A. M. and S. R. S. to Dr Hans Sloane, S. R. Secr. Containing a Relation of River and other Shells digg'd up, together with various Vegetable Bodies, in a Bituminous Marshy Earth, near Mears-Ashby in Northamptonshire: With some Reflections thereupon: As also an Account of the Progress he has made in the Natural History of Northamptonshire.*

IN obedience to your Commands, I send you the Account of the Land, and River Shells lately discover'd by the Worthy and Inquisitive Mr Coxe of *Mears-Ashby* in *Northamptonshire*, in a Moorish Pasture in *Mears-Ashby* Field. I visited the place my self, he very generously attending and assisting me. I know the Relation will be the more acceptable to you, and 'tis indeed of greater Regard, because Land and River Shells are so very rarely met with in Digging into the Earth, in comparison of Sea Shells, and the Teeth and Bones of Marine Animals; which indeed occur almost every where, and in all Countries. The Reason of which is now no longer a Difficulty, these Bodies having been shewn to be all Remains of the Universal Deluge; and the Marine Shells being more ponderous than those of the Land and Rivers, sunk and were lodg'd deeper in the Earth, and so were preserv'd by that means; whereas the later being left generally

nerally upon the Surface, perish'd, and are at this day rarely met with.

Causing one to dig into the Moorish Ground above-mentioned, we found a small number of Snail Shells of various kinds buried there. At about a foot in depth they lay very thick; and sinking still downwards the number rather encreased till we came to the depth of about three foot. 'Twas troublesome to sink deeper on purpose; but we made Tryals for a considerable extent of Ground, *viz.* about 250 foot in length, and 130 in breadth. Besides, the same Shells were cast up in several places, at distance, by Moles. What we principally observed in this search was 1. A moist Moorish black Earth, in some places a foot and a half, in others somewhat above two foot in thickness. The lower half of it is blacker and denser than the upper half, of a Bituminous Nature, and has all the Characters of Peat-Earth. Besides Shells we found Stalks and Leaves of Grass, and also of many Kinds of other Vegetables repositd as usual in like Bituminous Moors, in other parts of this Island. 2. White Earth; so at first we call'd it: But upon closer Inspection it appear'd to be little more than Hay half wasted. So deep as we sunk into it, we found it every where copiously interspers'd with Shells.

The finding these Shells Under Ground made it very reasonable to enquire whether there were any of the like at this time living upon the surface. I diligently search'd this place, but cou'd not meet with any Live ones of any Kind whatever there.

The Fossil Shells were some the *Exuvie* of Land-Snails, the rest of River or Fresh Water-Snails: Of the former there were the three following kinds. 1. A small *Buccinum* of five wreaths, the *Buccinum exiguum quinque ar- fractum*, Tit. 7. List. in *Traité de Cochleis Terrestr. Angl.* A Kind observ'd by Dr Lister to live in Moss upon old Gardens.

Garden Walls at *Estrop* in *Lincolnshire* ; by my self, at the Mossy Roots of Old Trees in many of the *Northamptonshire* Woods, as also amongst Moss upon the Boggy sides of several standing Springs.

2. A *Cochlea* of the compressed Kind, but not so much compressed as some of them are. It has five Wreaths and a small circular *Sinus* in the Center. This, if it is not the *Cochlea umbilicata* &c. N. 79. *List. Hist. Conchyl. Lib. 1.* has not hitherto been mention'd by any Writer ; tho common enough in the Woods in *Northamptonshire* : I found a greater Number of them, for the Compass of Ground, inclos'd in the Earth, than ever I have done in any of the Places where they naturally breed.

3. The *Cochlea citrina* Tit. 3. *List. de Coch. Terrestr. Ang.* The Common Strip'd Snail-shell. But most of these in the Moor are White, of the Colour of the Shells that have been a long time dead. In some I saw faint footsteps of their former Stripes. Most of the Shells of this Kind were lodg'd about 4 foot deep.

We met with only two different Kinds of River-Shells.

1. A Perewinkle Shell of three Wreaths, generally less than the *Buccinum trinum* Spirar. Tit. 24. *List. de Coch. Fluvial. Ang.* There were a greater Number of these buried in the Moor than of any of the former Kinds.

2. A Perewinkle Shell of five Wreaths, much smaller and more prominent than those of the *Buccinum longum* sex Spirarum Tit. 21. *List. de Coch. Fluvial.* 'Tis otherwise very like that *Buccinum* in the fashion of its Wreaths. It has not yet been describ'd by any Author. We find the Kind now living in one of the *Northamptonshire* Brooks call'd the *Ise*.

The Moorish Ground wherein these Shells were buried extends from near the top to very near the foot of a small Hill. Above the Moor, upon the Top, and at the Brow of the Hill, is a Sandy Soil of a Reddish Colour. The whole

whole face of the Moor is plain and even, conformable to the rest of the Hill not thus Moory of the same Declination with it ; and appears to be in a Natural, and Undisturbed State, as much so, as any of the Slades in the Neighbouring Fields ; excepting that 3 or 4 Trenches have been cut through it of late.

'Tis evident that these Shells were left at the Deluge, when those from Sea were also repositied at Land ; and not buried since by Deterrations from the Ground above. For then the upper parts of the Moor must have been cover'd with a Reddish Sand, such as the Ground is for the main compos'd of ; but nothing like that appears near the Shells in this Moor. Besides, here are dug up several Shells that in all likelihood never bred here, but are Inhabitants of a different Soil : Particularly the striped Snail-Shell. For these Animals have peculiar Soils, and affect particular Regions.

But what I here give only brief hints of, will appear in a much better Light when rank'd amongst other like Relations, in the Natural History of *Northamptonshire*. You are very kind in your Enquiries about the Progress of that Work ; and very many of my Friends in this Country have been pressing in their Sollicitations to have it at an end. I am mighty sensible of their Good Wishes both to me, and to that Undertaking ; and hope all here are now well satisfied it goes on as fast as is practicable. I have indeed exceeded the time I at first propos'd ; but this is owing to the Growing of Materials upon my Hands, and the Difficulty of treating of them in a manner that was fit, and would render the Design useful. Those who have well weigh'd this, leave me very frankly to my own Time : And I will do my best to acquit my self of the Task with such Dispatch, that they shall have no Cause to think their Indulgence and Generosity misplaced. I have gone through the several Heads of the Heavens and Air, the Waters, the Earths,

the Stones, the Sea Shells and other Marine Bodies found at Land ; and am now upon that of the Plants ; having only that of the Brute Animals, that of the Humane Bodies, and that of the Arts, to finish. Now as to this, at the same time that I will have more Regard to the Performing it in such a manner, as to render the Design Useful, than to the hurrying it to an End ; and you and the rest of my Friends may depend upon't, that I will not lose one single Hour that I can spare from the Exigences of my other Affairs, till I have accomplish'd the whole. I am

S I R,

Yours, &c.

J. Morton.

V. *An account of a very large Tumour in the fore part of the Neck, &c.* By Dr James Douglas.

I Lately had the opportunity of opening a Woman, about 50 years old, who had a very large Tumour, or hard Swelling, in the fore part of her Neck, possessing all the space between the whole extent of the lower Jaw and the upper part of the *Sternum*, with a considerable rising in its middle ; laterally its point inclining to the Left side, tho the biggest part of the Tumour was on the Right. The Skin on the *Apex* of this protuberating part was thin and shrivell'd, of a colour different from the rest, and lookt as if the Swelling would have broke in that place.

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The Skin was exceeding thin, having no Fat under it, only in a cavity between two Lobes, to be afterwards described, on its Right side, there was a small appearance of some ; for the Skin being less stretcht there, the Cells of the *Membrana adiposa* were not quite empty.

The fleshy Fibres of the *Latissimus colli* were scarce visible.

The *Mastoidæus* and *Coraco-hyoidæus* were extremely thin, and in their ascent they adhered very firm to the subjacent Tumour.

The *Sterno-hyoidæus* and the *Sterno-thyreoidæus*, that run up the fore part of this Swelling, were distended so thin, that it was difficult to separate them from it, especially the last named.

The Right *Carotid* Artery, in its ascent to the Head, run along its outer edge, which encreasing, did much obstruct the current of the Blood that way.

The Internal *Jugular*, the *Par Vagum*, and the Inter-costal Pair went also over some part of this Swelling in their descent to the *Thorax*. Two of the Lymphatick Glands of the *Jugular* Vein were swelled to the bigness of little Eggs, being placed at some distance one from another, with a hollow between, where some Fat was found ; these two Lobes made the Tumour very uneven also on its Right side.

These Muscles, the *Jugular* with the two Glands adhering to it, and the rest of the fore-named Vessels being removed on both sides, I could easily observe the bigness, the figure and the circumscription or limits of this preternatural Tumour, with all its adhæssions to the adjacent parts.

In Magnitude it seemed to exceed that of two Fists joyned together.

Its figure was almost triangular, with a broad Basis under the Chin, sloping a little on each side, as it descended to the upper part of the *Sternum*, where its point

was pretty narrow ; its surface was made uneven, by three risings, of which the largest was turned to the Left side ; the other two being placed on the Right, as above remarked.

It adhered by Membranous Filaments to the *Maxillar* Glands, to the *Digastrick* Muscle, and to the *Stylohyoidæus* ; under which, on the Right side, a small portion of it, in the form of a Nipple, did intrude itself as it were under the Tongue ; in the upper and fore-part it also adhered to the *Os hyoides*.

Laterally it was connected to the *Levator Scapulæ*, and lower down to that part of the *Cucullaris* that terminates into the *Clavicle*, backwards to all the fore-part of the *Aspera Arteria*, between its third or fourth Cartilaginous Ring and the *Os pectoris*, as also to that Muscle of the Head called *Rectus Internus major*, and to some part of the *Scaleni* ; its lower part was engaged under the *Jugulum*, or lunated part of the Breast-bone, to which it adhered.

It was easily freed from its connexions to all these different parts, but not so from the *Glandulæ Thyreoidææ*, to which it adhered after a far different manner ; for where the *Thyroidal* Glands are joyned to one another, a little below the *Cartilago Cricoides*, on the fore-part of the rough Artery, there was no separating of it without cutting its substance ; whence it plainly appears, that the Union of these Glands was the root or beginning of this excessive Tumour : And yet, which is very remarkable, the Glands themselves kept their usual figure, and were no larger than ordinary.

This Tumour was hard and very firm, being exactly of the consistence of a Cows Udder when boyled, yet in a few places it was softish, containing a liquid and thick Juice.

Its Colour was chiefly of a Whitish Yellow, only in some places it was exceeding Red, from its having a greater

greater store of Blood Vessels, and in others it was very White.

I was not a little surprized to hear the edge of my Knife grate against something hard, while I was cutting it, which made me proceed with caution; not to spoil whatever it was that made the resistance; I therefore pared off all the soft part, and the hard substance that remained I boyled, and then cleared it very well, having left sticking to it at one corner a soft Cartilaginous Body, which possibly, had the Patient lived longer, would have acquired the same degree of Induration. It very much resembles a piece of white unpolished Rock Coral; but whether it may be reckoned osseous, or if it be rather the Viscid Humour of the Glands hardened and concreted into this irregular Chalky or Gravelly Substance, or whatever else it may be, I leave, Sir, to your better Judgment to determine. See Fig. 1.

I remember about two years ago I found in the *Prostates* of a very old man a great many hard Bodies, like White Peas, being of a Substance exactly like this, only smother on the outside; some of these were in the Body of these Glands, others adhered by small Roots to the Muscular Membrane that Invests them. Fig. 2.

The first appearance of this large Swelling was about twenty years ago, caused by the breaking of a Vein, as the good Woman used to express it, in a hard and very difficult Labour. It increased but very slowly, not arriving to any considerable bulk till a few years before she dyed; it was never very painful, being a true Schirrhus: Many things by several Persons had been used and applied unsuccessfully. Its bigness at length became very troublesome, in impeding her Swallowing and free Breathing, and at last it quite choaked her, by compressing the Wind-pipe, upon which it lay.

But besides this, I observed another remarkable accident, which did much hasten her end, being very painful and troublesome for a year or two before she dyed.

The *Uterus* was entirely Shittrhous, and distended to that degree, that it filled up the whole Capacity of the *Pelvis*. Part of the *Colon* and *Ileon* adhered so firmly to it, that there could be no Separation without tearing: Both the *Ovaria* and the *Tubæ* grew close to it; and indeed the Confusion and Mixture of all these parts was so great, that if the *Ovaries* had not been swelled here and there with Hydatidal Tumours, I could not have distinguished them.

The Neck of the Womb was pressed down so low, that upon a very gentle dilatation of the *Labia* it offer'd itself to view, being extreamly hard, but yet smooth and even, and so closely shut, that I could pass nothing without cutting.

It had squeezed the *Vesica Urinaria* so close against the *Os Pubis*, that it could contain but little or no Urine, which obliged her to make it often, and with pain.

The pressure of this part backwards was so great upon the *Intestinum Rectum*, that the evacuation of *Fæces* had been obstructed for the space of five weeks before she dyed.

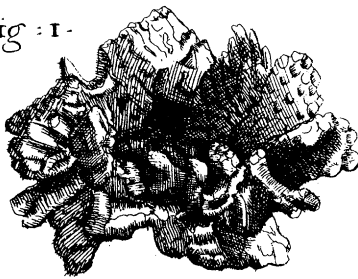
Indeed there was observed to come away *per Anum* for some considerable time a great deal of *Pus* and Slimy Matter, but that proceeded from the *Uterus*; for the Acrimonious Humour, which was wont to be discharged *per Vaginam*, having been pent up within its Cavity, by the close Constriction of the *Collum Uteri*, had corroded, and eat its way through the substance of the Womb into the *Rectum*, by which it had its vent: Which deplorable case I have more than once observed in Dissection.

The

The thickness of the Womb was near two inches, and in its bottom there was a great deal of this Humour, White and thick, which upon touching made the ends of my Fingers white and rough, by shrivelling the *Cuticula*, as if I had washed them with a strong Solution of some Acrid Lixivial Salt. Thus the Caustick Salt lodged in Soap affects the Hands of those Women that wash Linnen. It was very hard to take the *Uterus* out of the *Pelvis*, by reason of its so close adhesion to the neighbouring parts.

I had forgot to take notice, that the *Fæces Alvine*, contained in the Guts, were but few, by reason she could not swallow any thing solid for a long time, but very hard, and in several distinct Clots.

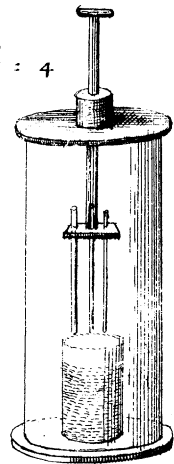
Fig: 1-



$f = 3.$



$f = 4.$



$f = 2.$



VI. *Part of a Letter from the Reverend Mr W. Derham, F. R. S. concerning a Glade of Light observed in the Heavens.*

Upminster, March 28, 1706.

AS I was observing the Immersions of the 3d and 4th Satellite of $\frac{1}{2}$ on the 20th of this month in the Evening, I espyed a very odd sort of Light in the Constellation of γ , the lower end of which was below the Bull's Eye, and the other a good way above it, and that Star about the middle of the lower end thereof, as in Fig. 3. which doth represent its appearance to me. This Glade of Light had the same Motion that the Heavens had, and was much like the Tail of a Comet, but pointed at the upper end, as in the Figure. This Light, I doubt not, is such as Dr *Childrey* first observed in *England*, and which *Cassini* and others afterwards observed in *France*, as Dr *Hook* saith. I am sorry that the following Nights were Cloudy ; and although *Easter-day* Evening was fair, yet I forgot it unluckily then. And *Easter-Monday* being Cloudy in the Evening, I could not observe it a second time till *Tuesday* last, and then it was gone.

VII. *An*

VII. *An Account of an Experiment made before the Royal Society, touching the Proportion of the Weight of Air, to the Weight of a like Bulk of Water, without knowing the Quantity of either. By Mr Hra. Hauksbee, F. R. S.*

I Took a Bottle somewhat of an Oval form, (which I had purposely caus'd to be made so, that it might with more ease Librate in Water.) It held more than three Gallons, (but how much we have no occasion to know.) Into this Bottle I put as much Lead as would sink it under the surface of the Water, and was, when weigh'd in that Element, Ballanc'd by a small Weight in the scale on the other end of the Beam. I chose to include my Weight, to prevent the Inconveniency of Bubbles of Air, which I knew would plentifully adhere to and lurk in the Irregular Body of the Weight, had it been fixt on the outside; and must (I think) of necessity make an Error in an Experiment which requires so great a Nicety as this. Thus provided, the Bottle being clos'd with Common Air, was by a Wire suspended at one end of a very good Ballance, and being in the Water, was Counterpois'd by a Weight of 385 Grains and a half in the Scale hanging on the other end. Then being taken out and screw'd to the Pump, it was in 5 minutes of Time pretty well exhausted, the Mercury in the Gage being Elevated to near 29 inches and a half. It was then taken off the Pump, but first, by Turning a Cock that Screw'd both to it and the Pump, the Air was prevented from Returning into it. In

this manner it was again put into the Water, and suspended as before on the Ballance, and it then weigh'd but 175 Grains and a half, which Subtracted from the first Weight, gave 183 Grains the Difference; and was the weight of the Quantity of the Air drawn from the Bottle by the Pump. Then opening a Cock under Water, the Water was at first violently Impell'd in the Bottle, (but Abating Gradually of its force,) till such a quantity was enter'd as was equal to the bulk of Air withdrawn. (So that by Making the Experiment after this manner, a person need not be very sollicitous in the nice Exhaustion of the Receiver, for it must of necessity Answer Reciprocally to the Respective Quantities taken out, the Remaining Air being weigh'd at last as well as at first; and no greater quantity of Water can Enter the Receiver, than what will supply the space deserted by so much Air.) The Bottle now being again weigh'd, it was found to be 162132 Grains. From which 175 Grains and a half being subtracted, (which is the weight of the Bottle more than its like bulk of Water) there remain'd 161956 Grains and a half, which being divided by 183 Grains, the weight of the Air taken out of the Receiver, gave the Proportion as 885 to 1. The *Averdupoize* Weights being brought to Ounces, I reduc'd to Grains, by multiplying them by 438, the just number of Grains contain'd in an Ounce of that Weight. The Column of *Mercury* in the Barometer at the same time Measuring 29.7 Inches. The Season of the Year is to be consider'd, (which was *May*) and I doubt not but if the Experiment be Repeated in *December* or *January*, a sensible difference will ensue.

VIII. *An Experiment made at Gresham-College, shewing that the seemingly Spontaneous Ascention of Water in Small Tubes open at both ends is the same in Vacuo as in the open Air. By Mr Fr. Hauksbee, F. R. S.*

I Took three pieces of small Tubes of Different bores, and fixt them in a piece of Cork directly Perpendicular, with their Lower Orifices as nicely even as I could. The same Cork I likewise fasten'd to a Wire, which pass'd through some Collars of Leather, included in a Box on the Upper Plate of the Receiver; by which means, I could at pleasure elevate or depress the Tubes without any danger of the Air's Insinuation. (See *Fig. 4.*) Thus prepar'd, and ting'd Water set on the Plate, the small Tubes (which never had been wetted) were drawn to the upper part of the Receiver by the premention'd Moveable Wire. When the Air being withdrawn, the Tubes were caus'd to descend (by the same Wire as drew them up) till their lower ends were plung'd just under the surface of the ting'd Liquid; where they no sooner were, but the Water rose in each of them a considerable height above its surface in the Glas, and higher in the smaller Tubes than the larger; and would retain such a quantity as voluntarily arose in them, (if I may call it so,) notwithstanding their lower Orifices were drawn out of the Water. Upon letting in the Air again they continu'd just the same as *in Vacuo*. I found by plunging Tubes of several sizes in the ting'd

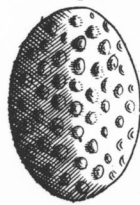
Li-

Liquid, that so much of the Liquid would remain suspended in them, when taken out of it, as it would in such Tubes when plung'd be Elevated above the surface of the Stagnant fluid: I have likewise since observ'd, upon bending some small Tubes by the flame of a Candle, in manner of Syphons, that it would require the Orifice of the longer Leg to be at least so far below the surface of the Stagnant Water, as that Water in the same Tube would spontaneously ascend in it, before it would run.

London, Printed for Sam. Smith and Benj. Walford, Printers to the Royal Society, at the Prince's Arms in St Paul's Church-yard, 1706.

Tab = 1.

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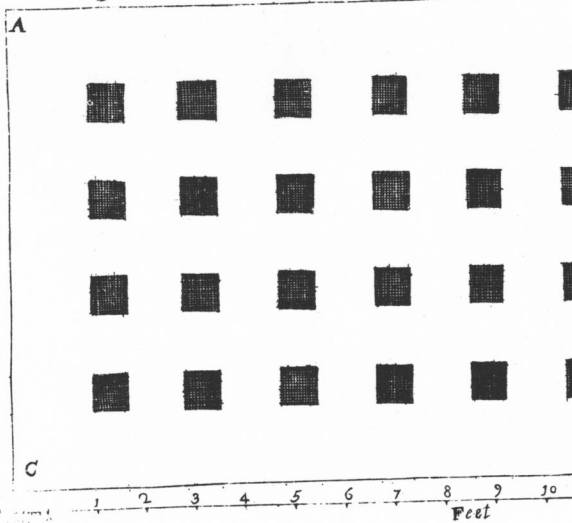


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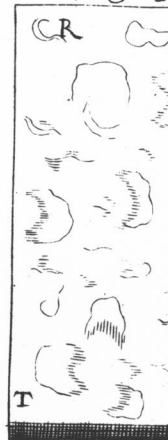
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Fig : 1.



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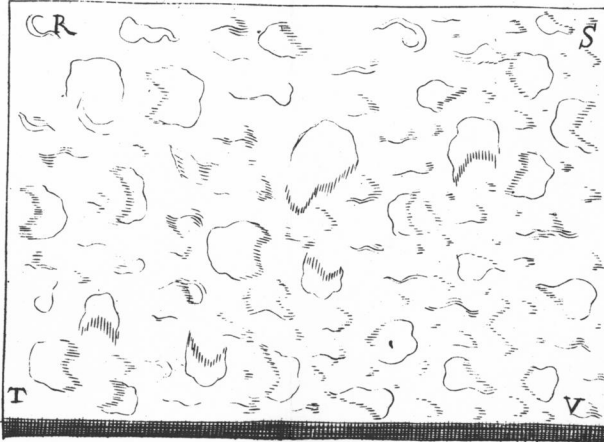
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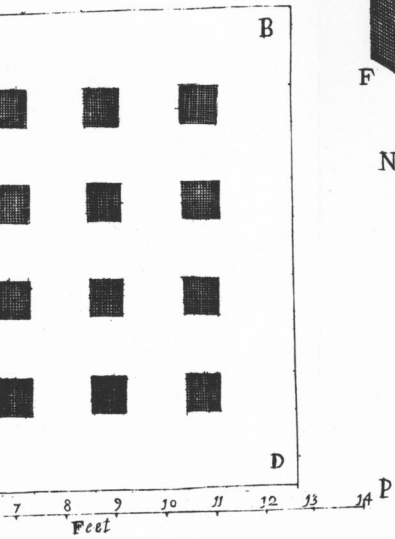
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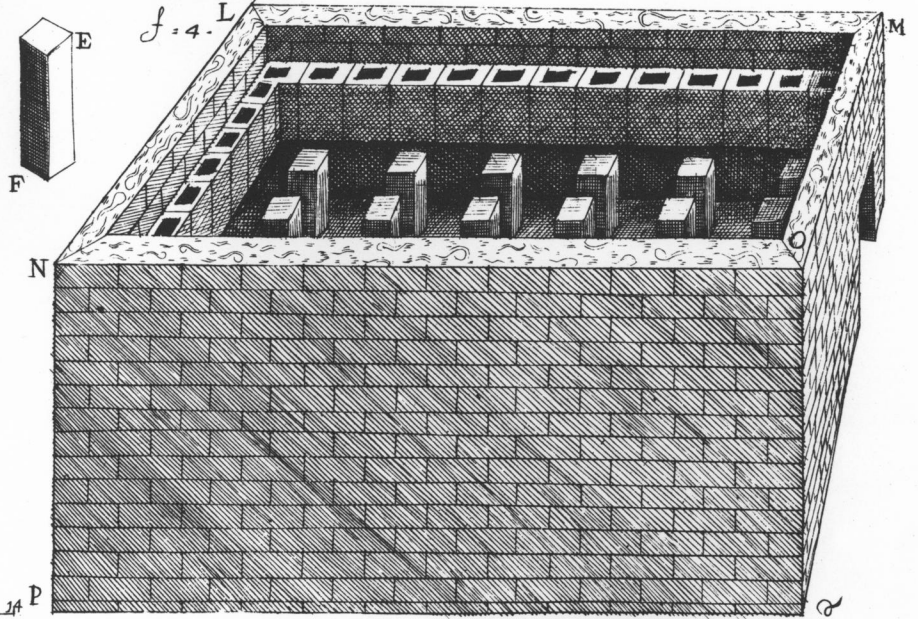
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PHILOSOPHICAL TRANSACTIONS.

For the Months of April, May, and June, 1706.

The CONTENTS.

- I. *A Description of a Roman Sædatory, or Hypocaustum, found at Wroxeter in Shropshire, Anno 1701. By Mr John Lytler. Communicated to the Royal Society by John Harwood, LL. D. and F. R. S.*
- II. *A Letter from Dr John Harwood, LL. D. and F. R. S. to Dr Hans Sloane, R. S. Secr. concerning the forementioned Hypocaustum. With Part of two Letters from Mr William Baxter to Dr Harwood, relating to Wroxeter, and the Hypocausta of the Ancients.*
- III. *A Letter from Dr William Musgrave, Fellow of the College of Physicians, and R. S. to Dr Hans Sloane, R. S. Secr. concerning the Jaundice, occasioned by a Stone obstructing the Ductus communis bilarius, which was afterwards voided by Stool.*
- IV. *Part of a Letter from Mr Ralph Thoresby F. R. S. giving a farther Account of an Eruption of Waters in Craven.*
- V. *Observations of the Solar Eclipse May 1-12. 1706. At the Royal Observatory at Greenwich, &c. communicated by the Reverend Mr John Flamsted, Math. Reg. & F. R. S.*
- VI. *An Abstract of a Letter written from Geneva, May the 31st, 1706: N. S. by Monsieur J. Chr. Facio Duillier, R. S. S. to his Brother Mr Nic. Facio, R. S. S. Containing some Observations of the Sun's Eclipse, on the 12th of May, 1706. N. S.*
- VII. *Pars Epistolæ a Cl. D. Joh. Jac. Scheuchzer, M. D. Tigur. & Societatis Reg. Lond. Soc. ad D. Jacobum Petiver, dictæ Societ. Soc. de Eclipsi Solistotiali Die 12 Maji Tiguri observata.*
- VIII. *An Account of the Death and Dissection of John Bayles of Northampton, reputed to have been 120 years old. By Dr James Keill.*
- IX. *The Construction and Properties of a new Quadratrix to the Hyperbola, by Mr . . . Perks. Communicated by Mr Abr. de Moivre, F. R. S.*
An Account of a Book entitled,
- X. *Samuelis Dale Pharmacologie seu Manuductionis ad Materiam Medicam Supplementum: Medicamenta Officialia simplicia priore Libro ommissa complectens: Ut & Notæ Generum Characteristicæ, Spectrum Synonyma, Differentiæ & Vires. Cum duplici Indice, generali altero Nominum & Synonymorum præcipuorum, altero Anglico-Latino, in gratiam Tyronum.*

- I. *A Description of a Roman Sudatory, or Hypocaustum, found at Wroxeter in Shropshire, Anno 1701. By Mr John Lyfter. Communicated to the Royal Society by John Harwood, LL. D. and F. R. S.*

ABout 40 Perches distant North from a ruinous Wall, call'd the *Old-Work of Wroxeter*, once *Uriconium*, a famous City in *Shropshire*, in a piece of Arable Land, in the Tenure of Mr *Bennet*, he observed, that altho these Fields had formerly been fertilized and made very rich by the Flames and Destruction of the City, yet a small Square Parcel thereof to be fruitless, and not to be improved by the best Manure. He then guessing the Cause of Sterility to be underneath, sent his Men to dig and search into it; but the Soil being then unfown, caus'd them to mistake, and search in a wrong place; where they happen'd upon Bottoms of old Walls, buried in their own Rubbish, (being such as are often found in those Fields;) and the Inhabitants digging one of them up, for the benefit of the Building-Stone, were thereby guided to the Western Corner of the said unprofitable Spot of Land: Where they found (near the Foundation) a little Door-place, which, when cleansed, gave Entrance into the Vacancy of a square Room, walled about, and floor'd under and over, with some Ashes and Earth therein.

This was built in times past (as some suppose) for a *Sudatory*, or *Sweating-house* for Roman Souldiers; being set with 4 Ranks of small Brick Pillars, 8 inches square, and laid in a strong sort of very fine Red Clay; each Pillar being

being founded upon a foot square Quarry of Brick ; and upon the head of every Pillar was fixed a large Quarry of 2 foot square, hard almost as Flint, as most of those *Roman* Bricks are, and within as Red as Scarlet, and fine as Chaik. These Pillars were to support a double Floor, made of very strong Mortar, mixed with coarse Gravel, and bruised or broken Bricks : The first of these Floors was laid upon the large Quarries, and, when dry, the second Floor was laid upon it.

But first there was a Range or Rank of Tunnel-Bricks, fixt with Iron cramps up to the Wall within, with their lower ends level with the under sides of the broad Quarries, and their upper ends with the surface of the upper Floor ; and every Tunnel had alike 2 opposite Mortice-holes, one on either side, cut through for a cross passage to disperse the Heat amongst them all. The Form of the whole will be better understood by inspecting the Figures.

Explanation of the Figures.

Fig. 1. A. B. C. D. is the Ground Plat, on which the Pillars of Brick stand.

Fig. 2. E. F. is one of the said Bricks ; which are in Numb. 24.

Fig. 3. G. H. I. K. is the Ceiling of Square Tiles, which lye upon the Heads of the square Pillars.

Fig. 4. L. M. N. O. P. Q. is the Sweating-House, in Perspective, shewing in part the Manner of the Floors and Pillars as they were placed.

Fig. 5. R. S. T. U. is the double Floor, whose upper surface lies even with the tops of the Flews in the Perspective Draught.

Fig. 6. W. X. Is one of the Flews, or Tunnel-Bricks.

II. *A Letter from Dr John Harwood, LL. D. and F. R. S. to Dr Hans Sloane, R. S. Secr. concerning the forementioned Hypocaustum.. With Part of two Letters from Mr William Baxter to Dr Harwood, relating to Wroxeter, and the Hypocausta of the Ancients.*

S I R,

THe first notice I had of the *Hypocaust* discover'd at *Wroxeter*, was from a Letter Mr *Baxter* communicated to me, which he received from the Reverend Mr *Markham*, the present worthy Incumbent of that Place; which gave me occasion of making farther enquiry, by writing to the Reverend Mr *Richard Lloyd* of *Salop*; who, at my request, was so obliging as to take a Journey and view it: The Remarks he then sent me, being mislaid, I must refer you to Mr *Lyster's* accurate Model and Description, which I am glad to hear you are about publishing in the *Phil. Transactions*. I have for some years cherisht an Acquaintance with Mr *Lyster*, whose Assistance in the late Edition of *Camden* ought not to have been past over in Silence, but deserv'd a more publick Acknowledgement; sure I am, had it not been for this Worthy Person, the Memory of so remarkable a Piece of Antiquity wou'd in all probability have been lost to Posterity.

I think it not impertinent, upon this occasion, that some Account shou'd be given of the Place where it was dis-

discover'd, as likewise of the nature or kind of the Antiquity itself : And certainly *Wroxeter* was one of the most Considerable Military Stations or Colonies the *Romans* had in this Island ; the City Wall, as appears from a Survey taken by Mr *Lyster*, was not much less than three Miles in Circumference ; 'tis not improbable, but that it was founded by *Suetonius Paulinus*, or after by *Agricola*, in their March to subdue *Mona*, now *Anglesey* : But not to trouble you with my own Conjectures, I send you along with this an Extract out of a Learned Work (which I hope will e're long see the Light,) I mean A *Glossarium Antiquitatum Britannicarum*, which was transmitted to me, by the obliging Author, my worthy Countryman, Mr *Baxter*, whose Skill and Knowledge in our *British*, *Roman* and *Saxon* Antiquities, as well as in all other useful Literature, is sufficiently known to you, and the rest of the Learned World :

The other Paper I send you, is A Letter I received some time since from the same Worthy Person, in Answer to some Enquiries relating to the *Hypocausta* of the Antients.

Since I did my self the Honour of presenting Mr *Lyster's* *Module* to the Society, I have been inform'd by the justly-admir'd *Vitruvius* of our Age and Nation, Sir *Christ. Wren*, that he discover'd the remains of such another *Hypocaust*, when they were laying the Foundation of the Kings House at *Winchester*.

Mr *Christ. Hunter*, in a Letter to Dr *Lyster*, dated May the 15th, 1702. since publisht in the *Transactions*, gives an Account of an Antiquity of this kind dug up in *Torkshire*, as appears from the Description he gives of it, (in the *Phil. Trans.* for the Months of *March* and *April*, *An. Dom.* 1702. Numb. 278. p. 1131.

The Ingenious Mr *Edward Lhwyd* in his useful Additions to *Camden*, takes notice of another discover'd at *Kaer hyu* in *Caernarvonshire* ; one of the Hollow Bricks or Tun-

nels whereof he there describes, and gives a Figure of it, in the Table of the Curiosities added at the end of the *Welsh Counties*; it occurs Numb. 8. to which I refer you.

Mr *Camden* himself mentions an *Hypocaust* discover'd at *Hope* in *Flintshire*, an Account of which is to be met with in his *Britannia*, Pag. 688, of the *English Edition*.

You see, Sir, how ready I am to comply with your Commands, and shou'd be glad of any other occasion, of farther approving my self

Your Obliged Humble Servant.

Mr Baxter's first Letter to Dr Harwood, concerning Wroxeter.

I Now transmit to you what I have Written in my *Glossarium Antiquitatum Britannicarum* concerning *Wroxeter*.

VEROCONIUM Antonini, atq; Ptolemæi Raven-
nati Monacho prodigiôsè, ut ferè omnia, UTRICO-
NION est CORNONINORUM, pro VERI-
CONIUM CORNOVIORUM, undè discimus
VEROCONIUM, seu VERICONIUM, fuisse
CORNAVIARUM, sive CORNOVIORUM
caput. Saxonibus VRECENCEASTER, nobisq;
hodiè correptè WROXETER est, pro WEROC-
CESTER. Nomen dedit hæc Urbs vicino monti
WREKEN appellato, atq; etiam vicino vico WROC-
WARDIN, quod ARCEM sonat. VEROCONI-
ENSE M. Nennio Britanno CAERURNACHappel-
latur; verum corruptè puto pro CAERUARNA-
ÛAG, sive CIVITAS ad CERVICEM AQUÆ.
De URNACO enim Gigante, de quo crepant Britan-
norum Fabellæ, piget quicquam referre. Neque sanè
VEROCONIUM ipsum quicquam aliud sonat,
quàm ÛAROCONÛJ, sive, CERVIX AQUÆ
PRIN:

PRINCIPIS, vel SABRIAN Æ. Nam & COND, & KEND Britannis erat proCAPITE, & PRINCIPLE. Idem igitur CONDŪI, sive CONŪI quod & SAVRIAN, sive AMNIS REGINA. Exstat etiam antiqui operis insignis Parietina, accolis vocati THEOLDWORK, sive ANTIQVUM OPVS, vel ÆDIFICIVM: quod equidem conjecerim ex Arcuum vestigiis Romanum fuisse Balneum. Antiqua durat inter plebem fama, hanc Urbem fuisse, immixtis de VEROCONIO monte Passeribus, à Danis incensam; quod quid sit alij forsitan melius dicent. Certè vel ferreum sigillum ibi erutum cui Reguli cujusdam Christiani caput Romano Diademate cinctum, & promissa comâ, sub hac Inscriptione CAPUT SERVITI DEI, satis indicio est, eam non fuisse à Saxonibus deletam. Hujus Sigilli E&typon aliquot retro annis perquam humaniter mecum communicavit modò Reverendus VEROCONIENSIS Ecclesiæ Presbyter, *Thomas Markham*. Imò & crediderim vel ex Ravennatis Itinerario eam ad ejus tempora, hoc est penè ad Octavum Sæculum, adeoque aliquanto diutius, floruisse, & caput fuisse CORNAVIVM, forsitan etiam Regia Merciorum Sedes. De tantæ urbis rudetibus, melioribus, uti quidem speramus, auspiciis caput suum extulit VEROCONIVM NOVVM, non ita longe à vetere positum, de Alneto Britannis, ut vulgo fertur, dictum PENGŪERN; cum nobis ex Autoritate vetustissimi cujusdam Bardii PENGŪERN POWYS sit in VENEDOTTIS in Agro Montegomerico. Saxonibus appellatur SCROBESBYRIG, quod est CIVITAS INDUMIS. Britannis etiam hodie eodem plane intellectu AMWITHIC. Siquidem WYDH, sive GWYDH, vel, ut in Legibus Regis Howel scriptum legimus, WYTH Britannis dicitur SYLVA, additâq; Præpositione AM, quod illis, ut & Latinis *circum* est, AMWYTH dicentur *humiliora fruticeta*, Saxonibus SCROBES, & vernacula Dialecto SHRUBS. De AMWITH etiam

Adjectivum effingitur AMWITHIC, five DUMO. S A. Normanni tandem, complanato agresti sono, de SCROBESBERIE fecere SLOPESBERIE, de quo Latinizantium SALOPIA, ut & SALISBERIE de SARISBERIE. Hæc equidem eo libentius commemoro, quo antiquæ Patriæ meæ memoriæ redderem illustriorem. Siquidem in hac Urbe duobus retro sæculis Majores mei Duumviratu, summo ejus loci honore, functi sunt, posteriq; eorum civitate gaudent perpetuâ: quod de Romano antiqui VEROCONII jure tractum existimo.

A second Letter from Mr Baxter to Dr Harwood, concerning the Hypocausta of the Ancients.

S I R;

THE Ancients had two sorts of *Hypocausta*; the one called by Cicero, *Vaporarium*, and by others, *Laconicum*, or *Sudatio*, which was a large Sweating Bath. In which were *Tria vasaria ænea*, called *Caldarium*, *Tepidarium*, and *Frigidarium*, from the Water contained in them. The other sort of *Hypocaustum* is not so distinctly handled by Antiquaries, and it was a sort of a *Fornax*, or Kill to heat their Winter Parlours, or *Cœnatiuncula Hybernæ*. *Erat & Dieta, five Cœnatiuncula* (saith Argol upon Panvinus) *sub quâ ignis accendebatur: Unde & Cœnatio Hypocaustum. Cœnati ones Æstivæ & Hybernæ*, are mentioned by Cicero in *Epistolis*. The Terrace Floor is called by Viruvius, *Testudo. Testudines Alveorum in Cœnatis Hypocausti calefacientur*, saith the same Author. This *Hypocaustis* was called *Alveus*, and *Fornax*: And the Man that tended the Fire *Fornacator*. The *Tubuli* seems to have been contrived to convey away the smother, that otherwise would choke the *Fornacator*. This kind of Stove seems to be graphically described by P. Statius in *Balneo Hetrusci*.

—— *Ubi Languidus ignis inerrat
Ædibus, & tenuem voluunt Hypocæsta vaporem.*

Of the Terrace *Argol* has these words: *Testudines sunt pavimenta sub quibus Fornax ardet.*

P. S. By the way, I take the word *Stove* to be derived from *Æstus*, quasi *Æstivium*: there wanting hitherto a probable Etymon.

III. *A Letter from Dr William Musgrave, Fellow of the College of Physicians, and R. S. to Dr Hans Sloane, R. S. Secr. concerning the Jaundice, occasioned by a Stone obstructing the Ductus communis biliaris, which was afterwards voided by Stool.*

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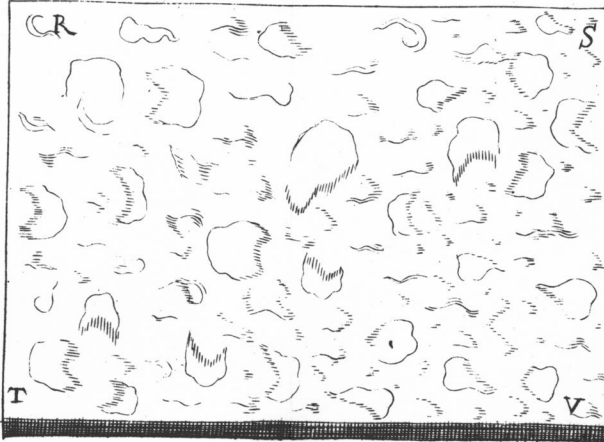
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It is a *Stone*, that Gentleman voided, some years since, by Stool; and which he represented to me, as having come from the *Ductus communis biliaris*: But the Largeness of it is such, as made the latter part of the account seem, at first hearing, somewhat dubious.

The Figure of this *Stone* is Oval; the Length almost an Inch; the Breadth, (or shortest Diameter) $\frac{7}{8}$ of an Inch: It weighed 59 Grains, when I saw it; but, at its coming off, was (as I am inform'd) above a Dram in weight:

Some

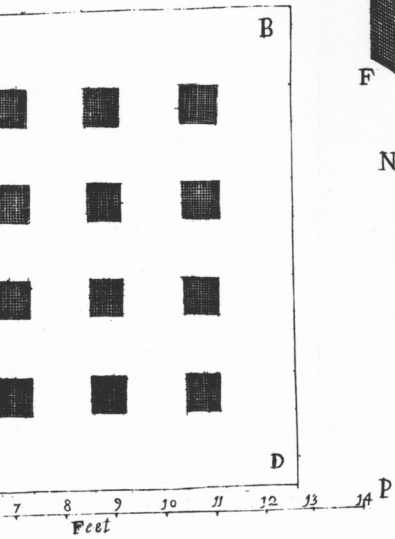
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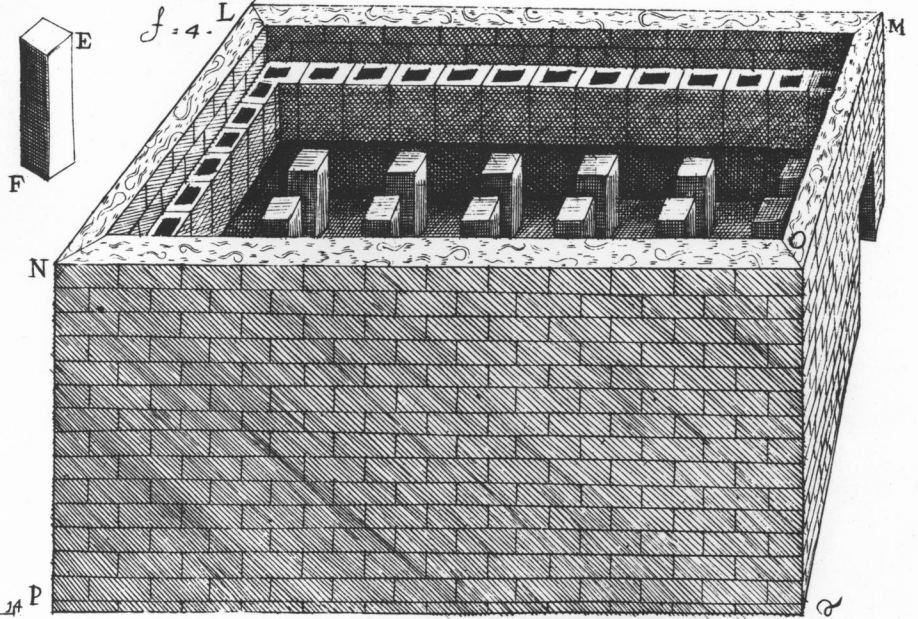
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Some

Some part of it being, by frequent handling, rubb'd away. The Surface rough, unequal, divided into several little Risings, each about the size of half a Vetch, or somewhat less.

You have in *Fig. 7. Y. Z.* The Proportions exactly drawn.

The many strong annular Fibres, which appear not only at the Orifice, where the *Ductus communis* opens into the *Duodenum*; but also all along the oblique passage, of that *Ductus*, between the Coats of the Intestine, (which passage is, according to Dr *Glisson's* measure, about half an inch in length) do, by way of Sphincter, keep this end of the *Ductus communis* very strait and close. And besides this straitness of the *Ductus*, the two Oblique Insertions, it makes at some distance from one another, thro' the two outer Coats of the *Duodenum*, render it yet more difficult, for a substance of any Bulk, to pass this way. So that, however great Stones may be generated in the Gall-Bladder, *Ductus Cysticus*, *Hepaticus*, or *Communis*, it is not easy to conceive, How a Stone of the Magnitude here describ'd, could possibly, through a passage of itself so very narrow, strait, and difficult, be convey'd into the *Duodenum*.

From these Considerations, I was extreamly desirous to hear, what could be said, to Prove, That this Stone was not form'd in the *Fistula alimentaris*, but (large, as now it is) came this way into it. In answer to which Inquiry, the Gentleman was pleas'd to let me know,

That, before the Discharge of this Stone, He had the *Jaundice*; which came suddenly on him, and continued several months, in a severe, and most excessive manner.

That this *Jaundice*, beside the discolouring of his Urine and Skin, to a very great degree; beside Loss of Appetite, Faintness, and many other Symptoms, usual in this Distemper; was also accompanied with a Pain (in, or) near the Stomach.

That, during this *Jaundice*, his Stools were of a white colour, as having very little, or no Mixture of Choler in them.

That, Travelling under these circumstances, more especially with a constant Pain, (as before mention'd,) in his Coach from *London* to *Clifton*; and, after a little time, to *Bath*; he found, a little after his Arrival at *Bath*, this Stone come off by Stool; and, together with it, almost a Spoonful of *Gravelly Matter*; and a considerable quantity of Choler, as appear'd from the yellowness of the Stools: All which happen'd so soon after he came to *Bath*, as Evidently to prove, the Discharge of both [Choler and Stone] to proceed from the motion of the Coach.

That his deliverance, from the *Jaundice*, commenc'd from the Expulsion of this Stone: For, soon after that, the Colour of the Skin and Urine, indeed all the ill Symptoms vanish'd; and, in a very little time, (Weakness only excepted) He recovered.

These Propositions, put together, make a considerable Argument, That the Orifice of the *Ductus communis* (how strait, and how strong soever) was, in this Gentleman, so far dilated, as to give way to the Stone, here described; that is, dilated to a Circle, in Diameter $\frac{7}{8}$ of an Inch, in Circumference one whole Inch and $\frac{1}{2}$.

The *Jaundice* is often observ'd, to be a most stubborn Distemper; not easily yielding to our most probable Methods; and many times to none at all. *Riverius* positively affirms, That, when it proceeds from a Stone obstructing the Current of the Choler, it is incurable: Urging this reason for his opinion; *Calculus, cum dissolvi non possit, morbum facit incurabilem*. Capite de *Ictero*.

When the *Jaundice* is thus difficult of Cure, especially when there is a probability (whether from a Pain fixt in, or near the Region of the Liver, or from any good Argument whatsoever) That it arises from the Cause now mentioned; rather than to Beat over the same ground to

no purpose, or other ground equally improbable ; it may not be amiss, to advise Exercise on Horseback, in Coach, or any other such way, as shall be likely to dislodge the Stone, and bring it off.

But, to make this Exercise effectual, it ought to be Violent, as the Patient can well bear it ; and in such manner, as may, by much agitation of the Body, be most conducing to the Design in hand.

The History, here mentioned, does sufficiently recommend this *Gymnastic Course* ; as capable of relieving, in some Cases of the *Jaundice*, when the best methods of Physick (for such we ought to suppose this Gentlemen had prescribed himself) fail of success.

Exon. Feb. 23. 1705-6.

IV. *Part of a Letter from Mr Ralph Thoresby, F. R. S. giving a farther Account of an Eruption of Waters in Craven.*

IN *Philos. Transact.* Number 245, is register'd the Vicar of *Kildnick's* Letter, which gives an account of an extraordinary Eruption of Water in *Craven*. I was lately enquiring further concerning it, of one that is now my Tenant and Neighbour ; and am not only fully satisfied of the Truth of what the said Mr *Pollard* affirms, but also that, as he conjectures, a great part of the Land is not to this day recover'd from the Sand and Stones, though a great number of People were employed about it. Upon the opening of the Rock, at the foot of which the Town of *Starbotham* stands, the Water gushed out in so vast a quantity, as if it would have swept away the whole Town :

Town : The Waves came rolling down, like long Swarths of Grass, one upon another, to use the Metaphor of the Relater, who had never seen the Sea. Several Houses were utterly ruin'd, and others wreckt up to the Chamber Windows ; one particularly so covered, that a great piece of the Rock was left upon the top of the Chimney. These things my Neighbour was an Eye-Witness of, and had many a weary day in clearing some part of his Land. His House was, for some time, full of Neighbours, who were harbourless by this sudden Accident.

Leeds, August 20, 1705.

V. *Observations of the Solar Eclipse, May 12. 1706*
At the Royal Observatory at Greenwich, &c. communicated by the Reverend Mr John Flamsted,
Math. Reg. & F. R. S.

THE Morning was Cloudy and Moist till about eight a clock, when the Clouds began to break, and we had sometimes a sight of the Sun through the spaces betwixt them. A Sevenfoot Telescope was fitted up with a Scene to receive the Species of the Sun cast through it, and on which it was about seven inches diameter, divided into digits by six concentrick Circles. But Clouds coming, the Sun frequently rendred this way of observing inconvenient, and therefore laying aside the *Apparatus* of the Scene, I viewed him through the same Telescope with Smoked Glasses, to save my Eyes, and I Noted:

1706. May 1st St. N. Manc.	Time corr. by the Pend. Clock. h ' "	
	8 21 30	A very small part of the \odot diameter was eclipsed.
	28 00	The Chord of the Arch of the \odot periphery eclipsed was $14'. 40''$. then followed frequent Clouds through the spaces betwixt, then some Zenith distances of the Sun were taken for correcting the Clock, and afterwards near the middle of the Eclipse.
	9 21 46	The parts of the Diameter remaining clear 5 00
	26 20	4 30
	10 31 50	Frequent large Clouds again till the Sun appeared through the breaks, and we saw the Eclipse was not ended. Clouds again till
	10 33 50	When the Sun shone out again we saw his Limb entire, and the Eclipse certainly over.

At Canterbury.

MR St. Gray had prepared a Scene placed behind his seven foot Glass, so that the Species of the Sun projected on it was seven inches over; but having the same sort of Weather we had at *Greenwich*, he saw not the beginning by reason of Clouds, but other Phases with the end he noted as follows.

Correct

Correct time
by the Pend. Clock.

h		
8	53	digits 5 $\frac{1}{2}$ darkned
9	08	_____ 7
	31	_____ 10 or more
	36	_____ The Sun shining for a short time, the Eclipse seem'd to decrease.
	55	_____ 7 $\frac{1}{2}$ a little clearer.
	57	_____ 6 $\frac{3}{4}$.
10	02	_____ 6.
	4	_____ 5 $\frac{3}{4}$.
	14	_____ 4
	16	_____ 3 $\frac{3}{4}$.
	20	_____ 2 $\frac{1}{2}$.
	30	_____ 1.
	31	_____ 0. $\frac{1}{4}$.
10	36	_____ The end accurately with a Tube of 16 foot.

At Horton, near Bradford in Yorkshire.

MR. *Abr. Sharp* cast the Species of the Sun on a Scene-plate, behind his Seven foot Glafs, so as it appeared seven inches over. By reason of Cloudy Weather, he saw neither the beginning nor end : But other Phases near the middle, as follows.

Times correct by
the Pend. Clock.

h ' "

8	35	00	digits dark	3 $\frac{1}{2}$	by Ocular Estimation.
9	01	00	_____	7 $\frac{1}{2}$	
	4	54	_____	8 $\frac{1}{10}$	Eclipsed on the Scene.
	6	33	_____	8 $\frac{1}{2}$	
	7	53	_____	8 $\frac{6}{10}$	
	12	50	_____	9	
	16	08	_____	9 $\frac{4}{10}$	
	18	48	_____	9 $\frac{1}{2}$	exactly, the ☉ shining out clear.
	20	45	_____	9 $\frac{1}{2}$	the ☉ still shining clearly. Great- est obscurity.
	21	48	_____	9 $\frac{1}{2}$	still clear.
	28	46	_____	9	
	44	45	_____	7	
	54	42	_____	5 $\frac{1}{4}$	
10	06	10	_____	3 $\frac{1}{2}$	
	19	55	_____	1	precisely.
	24	00	The ☉ seen thro Clouds, the Eclipse not ended.		
	30	00	The ☉ seen again perfectly round and entire.		

From Bern in Switzerland.

Captain Stannyan, who was there with his Kinsman, her Majesty's Envoy writes the same day to me, "That the Sun was totally darkned there for 4 $\frac{1}{2}$ minutes of Time; that a fixed Star and a Planet appear'd very bright; and that *his getting out of the Eclipse was preceded by a Blood red streak of Light, from its Left Limb; which continued not longer than 6 or 7 Seconds of Time*; then part of the Sun's Disk appear'd, all of a sudden, bright as *Venus* was ever seen in the night; nay, brighter; and in that very instant gave a Light and Shadow to things, as strong as Moon-light uses to do.

The Captain is the first Man I ever heard of that took notice of a Red Streak of Light preceding the emerſion of the Sun's body from a total Eclipse. And I take notice of it to you, becauſe it infers that *the Moon has an Atmosphere*; and its ſhort continuance of only 6 or 7 Seconds of Time, tells us that *its height is not more than the 5 or 6 hundredth part of her diameter.*

VI. *An Abſtract of a Letter written from Geneva, May the 31th, 1706. N. S. by Monsieur J. Chr. Facio Duillier, R. S. S. to his Brother Mr Nic. Facio, R. S. S. Containing ſome Obſervations of the Sun's Eclipse, on the 12th of May, 1706. N. S.*

THe total Eclipse of the Sun, which happened on the 12th of May, 1706. N. S. did preſent to the Inhabitants of *Geneva* a magnificent and ſurprizing Sight. Theſe more Learned did obſerve that Eclipse with much Satisfaction: But it did ſtrike many of the Common People with a great deal of Terror. A little after the Sun's riſing, the Sky did ſeem clear; tho the Air was thick already with ſome Vapours. Many little Clouds did afterwards ariſe here and there, and the Vapours did much encreaſe. For want of a Pendulum Clock, in a convenient place, the Moment of the total Immerſion, the Moment of the firſt Emerſion, and that of the End of the Eclipse, could not be accurately obſerved. Tho the Sky was ſomewhat overcaſt, the Heat of the Sun was already felt, when the Eclipse did begin: But a very ſenſible Coldneſs took place, as the Moon did, by degrees, cover

cover a greater and greater part of the Sun, and the Light decrease. The Eclipse was observed only with some Glasses, either darkned with Smoak, or but little transparent; and by receiving the Sun's Image, through a six foot Telescope, which represented the Objects inverted, upon a white Paper, placed at some Distance, from the Eye-Glass. When the Sun was near being totally dark, the bright Crescent, which did remain, was seen to diminish more and more, upon the Paper, where its Image was received. And when that Crescent was reduced to a very narrow Breadth, and to a very little Length, it was seen of a sudden to disappear: And in that Moment the whole Sun was eclipsed. At the same Instant of Time, the Darkness, which was already very considerable, did become much greater. The Clouds did change of a sudden their Colour, and became Red, and then of a pale Violet. There was seen, during the whole Time of the total Immersion, a Whiteness, which did seem to break out, from behind the Moon, and to encompass it on all sides equally. The same Whiteness was but little determined, in its outward Side, and was not broad the twelfth part of the Diameter of the Moon. This Planet did appear very black, and her Disk very well defined, within the Whiteness, which encompassed it about, and whose Colour was the same, with that of a White Crown, or *Halo*, of about four or five Degrees in Diameter, which accompanied it, and had the Moon for its Center. The Star of *Venus* was seen, at the same time, at some Distance, without that Crown, between the East and N. E. in reference to the Sun. The Planets of *Saturn* and *Mercury* were seen also by many, Eastward from the Sun's place. And if the Sky had been clear, many more Stars might have been seen, and with them the Planets of *Jupiter* and *Mars*; that towards the East, and this toward the West: And so the seven Planets might have been seen, almost all at once. Accordingly
some

some Gentlewomen, being in the Country, did tell, as is said, more than sixteen Stars. And many people, which were on the Neighbouring Mountains, did see the Sky Starry, in some places, where it was not overcast, as during the Night, in the time of the full Moon. The total Immersion did begin about three Quarters past nine. The Duration of the total Darknefs was precisely three Minutes, or 180 Seconds, to the Moment that the first Ray of the Sun did begin to appear again, with much Brightness. And this Time was observed, with a simple Pendulum; which was afterwards compared with a Pendulum Clock, shewing the Seconds, and regulated upon the mean Motion of the Sun. The Council was met, during the time of the Eclipse; but they did rise from their Seats, a little before the total Obscuration; because one could neither read nor write. They perceived, as they came down the Stair-case of the Town-House, some Swallows amazed, looking for a resting place; and many Bats flying out. In other places the Hens and Pigeons would make haste towards their Houses. There were seen, in several places of the Town, some Persons of the *Roman* Religion, and among them two Priests, prostrate on the Ground, and praying; thinking that the last Day was come. A little after the Sun had began to appear again, the Whiteness and the Crown, which did encompass the Moon, did entirely vanish. The Sun did then shew itself more and more; appearing at first as a little Crescent, which did still increase; and whose Concave Side did seem terminated, as by an Arch, described with the Compass. A little before the total Obscuration, the Country, on the West Side, did already seem overcast with Darknefs; and after the total Obscuration, the Darknefs was seen to leave us more and more, and to fly Eastward. According to Mr Professor *Gautier's* Observations, from the first Emer-
sion of the Sun, to the End of the Eclipse, there was

1^h 9' 30". As to the accurate times they are uncertain, the Pendulum Clock having been set only by a small Sun Dial. I send you also the following Account, which the same Gentleman did communicate to me.

" Observations on the Eclipse of the Sun, of the
 " 12th of May, 1706, made at *Marseilles*, in the
 " Observatory of the *Jesuits* of *St Croix*; by
 " Monsieur *Chazelles*, Ingineer of the Gallies,
 " and by Father *Laval*, *Jesuit*, Royal Professor
 " of Hydrography. h ' "

" The Eclipse did begin at _____ 8 28 40

" It did reach the Sun's Center at _____ 9 6 11

" It was total at _____ 9 34 15

" The Sun did begin to appear again at 9 37 9

" The Eclipse did come again to the Center at 10 12 23

" It did entirely end at _____ 10 47 50

" Three Stars were distinctly seen; and during three
 " Minutes it was not possible to read. And there did re-
 " main one bright Digit, all about the Globe of the
 " Moon.

The Mannor House of *Duillier* is in the Latitude of 46° 24'. In Longitude it is 4° 13' 45" to the Eastward of the *Royal Observatory* at *Paris*. And *St Peter's Church* at *Geneva* is, in Latitude, 0° 12' to the Southward, and in Longitude, 0° 5' 2" to the Westward of *Duillier*. But of this another time.

Before I make an end of this Abstract, I must take notice that, according to these Observations, the Altitude of the Moon's Atmosphere cannot well be supposed less than of 130 Miles, in perpendicular Height: Of which Miles 60 go to one Degree of the Earth. Neither could that Atmosphere be discovered, before the time of this Eclipse, by any Refraction of the Stars: Probably because of this Refraction's smallness; and for want of pro-

proper Observations. And tho it was very plain that the Atmosphere of the Moon must needs shew itself, in the time of a total Eclipse of the Sun; yet I do not know that any body did think of this, till, in the last Month of *May*, many Persons did actually see it. Such as have read Monsieur *Hugens's Cosmo-Theoros* may guess how much this Discovery would have been acceptable to that Illustrious Author.

Some particular Observations, which are intended to be made publick, do evince that our Atmosphere is sometimes visible, all along, from the Surface of the Earth to the perpendicular Height of one Semidiameter of the Terrestrial Globe. And the continued Appearance of a Crown, of only four or five Degrees Diameter, about the Sun, during the whole time of the total Obscuration, does shew that the Æthereal Matter, in which that Crown was produced, must be at a very great Height above the Surface of the Earth. But if that Crown was to be seen, so far as the Weather did permit, in all the Places, where the Eclipse was total, it must be concluded, that the Cause of it was not in our Air, but in some Vapours incompassing the Sun: And probably, in those very Vapours, which produce that pointed Light, that has been observed lying in a manner along the Ecliptick, and that has the Sun for Center. Now either of these Conclusions, *viz.* concerning the great Height of the parts of our Atmosphere, capable of producing that Crown, or else concerning a Meteor observed, not in our Air, but in the Vapours that incompass the Sun, is very singular, and deserves a great deal of attention. If ever such another Appearance should be seen, in the time of a total Eclipse, it would be proper to observe accurately the least Diameter of the Crown, from inside to *inside*: And to take notice whether, during the whole time of the total Immersion, the inward Circle be every where continued, and of an uniform Figure. The less the said Diameter,

and the greater the Excess of the Moon's apparent Diameter above that of the Sun ; as also the greater the apparent Altitude of the Sun is above the Horizon ; the higher the Cause which produces the Crown must be, above the Surface of the Earth. And the Position, upon the Moon's Disk, in reference to the Zenith, of the Points of Contact, where the Sun disappears, or begins to shew itself again, is here also of some consideration. As to the accurate Calculation, it shall be given in another place.

VII. *Pars Epistola à Cl. D. Joh. Jac. Scheuchzer, M. D. Tigur. & Societat. Reg. Lond. Soc. ad D. Jacobum Petiver, dictæ Societ. Soc. de Eclipsi Solis totali Die 12^o. Maij Tiguri observatâ.*

Illustri Societati indica, habuisse nos die 12^o. Maij Eclipsin Solis totalem simul & annularem ; totalem, quoniam Sol integer à Lunâ fuit obiectus ; annularem autem non propriè ita dictam, sed per Refractionem, quandoquidem circa Lunam fulgor apparuit rutilans, à radiis per Atmosphæram Lunæ retractis ortus. *Vide Tab. 2.*

Initium Eclipsæ fuit mane horâ 8. 54'.

Medium horâ 9. 58'.

Finis horâ 11. 12'.

Mora mediæ & plenæ obscurationis 4'.

Quâ visæ fuerunt Stellæ tam fixæ, quàm erraticæ ; ad nidos suos sese receperunt Aves ; prodire é latebris suis Vespertiliones, & Aquæ innatârunt Pisces : Nos autem experti sumus sensum frigoris manifestum ; & in Plantas decedit Ros.

Tiguri d. 21. Maij, 1706.

VIII. *An*

VIII. *An Account of the Death and Dissection of John Bayles, of Northampton, reputed to have been 130 years old. By Dr James Keill.*

John Bayles, the old Button-maker of Northampton, is commonly reputed to have been 130 years of age when he dyed. There is no Register so old in the Parish where he was Christened; but the oldest people, of which some are 100, others 90, and others above 80 years, remember him to have been old when they were young. Their accounts indeed differ much from one another, but all agree that he was at least 120 years. He himself did always affirm that he was at *Tilbury* Camp, and told several particulars about it; and if we allow him to have been but 12 years old then, he must have been 130 when he dyed.

He used constantly to walk to the Neighbouring Markets with his Buttons within these 12 years, but of late he has been decrepid, and carryed abroad. His Dyet was any thing he could get. I never heard he was more fond of one sort of Food than another, unless it was that about half a year before he dyed he longed for some Venison Pasty, but had it not. He dyed the 4th of *April* 1706. He lived in 3 Centuries, and in 7 Reigns.

His Body was extremely emaciated, and his Flesh feeling hard, the shape of all the External Muscles was plainly to be seen through the Skin.

The *Abdomen* being laid open, the whole *Viscera* appeared in good order, but more pale than they are commonly.

The *Omentum* was very small.

The *Stomach* was very much distended with Wind, and the Bottom of it wore extremely thin in that part which is next the *Spleen*, being hardly thicker than thin Writing Paper. In the inner Membrane there were no *Plicæ*.

The *Liver* was pale, but upon cutting was found perfectly sound. The *Gall Bladder* was of a larger size.

The *Spleen* was not so big as one of his *Kidneys*.

His *Kidneys* were firm and sound, as were all the *Urinary Passages*. In the *Right Kidney* were a few small yellow grains of *Gravel*.

The *Intestines* were all sound; the *Mesentery* was covered with *Fat*.

The *Cartilages* of the *Sternum* were not harder than usually they are. The *Ribs* were brittle, for by leaning gently upon one of them it broke.

The *Lungs* were attacked even to the *Pleura*: They were spongy, whitish, with many small black spots of *Blood*. The *Cavity* of the *Thorax* was large and clear.

The *Heart* was large, thick and fat; and tho he was always a little Man, yet the *Diameter* of the *Aorta*, before the *Carotidales* go off, was above two inches, which is considerably bigger than ever I remember to have seen.

The *Aorta* in the *Abdomen*, and *Illiacks*, was for the greatest part *Cartilaginous*.

The *Bones* of the *Skull* were sound and good.

On the inside of the *Dura Mater*, by the *Falx*, was a small ossification.

The *Brain* was more firm and solid than usual, and in cutting, hardly moistened the sides of the *Knife*. The *Ventricles* were full of *Serum*. He had lost the use of his *Eyes* for some years; but his *Hearing* was good.

he dyed. His Genitals, both Testicles and *Penis*, were of a large size.

There is no doubt but that the weakness of his Stomach, and the hardness of the *Aorta*, were the Causes of his Death. The Coats of the Stomach were so thin, that they had not strength enough to keep out the Air, and consequently his Digestion must have been spoiled. He had not eat-Meat for some years, and of late he lived only on Small Beer, Bread and Butter, and Sugars. And it was impossible that his Blood could circulate duly, whilst the great Artery, having lost its Elasticity, by being become Cartilaginous, could give no motion to the Blood. It is very probable that this was the Cause of his irregular and intermitting Pulse, which I have felt some years before he dyed. It is observable, that the greatest part of his Blood (which was in greater quantity than I expected) was contained in the Arteries, whereas generally in all dead Bodies the Veins are full, and the Arteries almost empty; for the Arteries being distended by the Blood, which they receive upon the last Systole of the Heart, by their natural Elasticity contract again, and empty themselves into the Veins, from whence it returns no more; but in this Man, the Great Artery having lost the power of contracting itself, it retained the Blood it received by the last Systole of the Heart.

This account agrees with that given of old *Parre* by the famous *Harvey* in most particulars, except in the Causes of their Deaths. But in both nothing seems more remarkably the effects of old age than the smallness of their Spleens, which undoubtedly was owing to the contraction of their Fibres in such a lax and spongy Bowel.

The whiteness of the Bowels in both must be likewise either from the same contraction or closeness of the Coats of the Blood Vessels, or from a want of Blood. *Harvey* says nothing of the quantity of Blood he found in old *Parre*;

Parre ; but if we may guess from his Body being fleshy, from the goodness of his Stomach and Appetite, and from the Disease he dyed of, there could be no want of Blood in him. In this Man there seemed to be more Blood than in several others I have seen, whose Bowels appeared more Red. And it can hardly be conceived, that the *Aorta* could be so large, without a large quantity of Blood, unless there had been some Stricture upon some other parts of it, which I did not perceive: And therefore it seems not improbable, that this whiteness of the Bowels was owing to the closeness of the Blood Vessels in both. It is no small confirmation of this opinion, that the Flesh and Skin felt hard, and the Brain firm and solid. I might add that it is highly probable, that the same disposition might give a closeness or hardness to the Vessels every where else. It is true, this was a Distemper, but then it is as true that it is a Disease of Old Age, and may justly be reckoned one of the effects of it. And for a farther proof of what I have said, I cannot but take notice, that in preparing a piece of the small Gut for an Injection, the *Tunica Villosa* felt more like a fine File than the softest Velvet ; and that I could use more violence in injecting the Vessels than these parts will usually bear. Whoever considers how soft a Substance an Animal Body is at its first beginning, and how from time to time it acquires a firmness and solidity, will easily be induced to believe, that Old Age brings a more than ordinary hardness to all the Fibres and Vessels.

The necessary consequence of this hardness, and contraction of the Fibres and Vessels of old people, is a diminution of their Secretions, which *ceteris paribus* are always proportional to the Orifices of the Glands. Hence it is that we find the Skin of old people always dry, their perspiration being very little. They are likewise generally bound, old *Bayles* went to Stool but once in ten or twelve days for some years ; and old people are always com-

complaining of a want of moisture, not that the Radical Moisture is dried up, but because the natural secretions, by reason of the contraction of the Glands, are diminished. I have already observed, that we found in this old Man more Blood than could have been expected in such an emaciated Body, and without doubt it had been larger, if his Stomach and Appetite had been as good as old *Parre's*. The fullness of the Vessels, and the frequent Rheums and Catarrhs of old People, evince this necessary consequence of the closeness of the Coats of the Vessels: All which agrees with what the Writers of *Institutions* say, that old Men are *ratione partium solidarum frigidi & sicci, ratione excrementorum frigidi & humidii*.

From this retention of the excrementitious parts of the Blood, we may expect all the ill consequences of a vitiated *Plethora*, and languid motion of the Blood; for the Fibres of the Arteries being now become hard, instead of assisting, they obstruct the Heart in circulating the Blood; and the quantity of Animal Spirits separated in the Glands of the Brain, must likewise be less, not only because of the retention of the Excrementitious Humours, but also because of the closeness and firmness of the Brain itself, so that the contractions of the Heart and all the Muscles must be weak, and consequently the motion of the Blood languid.

*Gelidus tardante Senecta
Sanguis hebet.*

A due conformation of all the Vital parts is most certainly necessary to bring a Man to a full old Age; but above all the rest, there are two which to me seem to have had the greatest share in procuring a Longevity to old *Parre* and *Bayles*, by retarding the ill effects just now mentioned. The first is the Heart, which in both was strong and fibrous; for that being left alone to labour
the

the circulation of a large quantity of sluggish Blood, a great strength is absolutely requisite to propel the Blood through unactive Vessels to the extremities of the Body, and back again. No doubt this is more easily done in Men of a low stature (as old *Bayles* was) which I am apt to think was a qualification of old Age. The second was the largeness of their Chests, and goodness of their Lungs, by which the Air had its full effort upon every Particle of the Blood, in rendring it florid and attenuating it, that it might easily move through the contracted Channels of an old Body.

Few have the happiness of such a Heart and Lungs, yet most men wish to live long; nor was it easy for Physicians to give Rules for preventing the ill consequences of extream old Age, whilst the effects of a long Circulation of the Blood were unknown; of which we can be certain only by Dissections of old persons, and these are not numerous enough to ground any thing certain upon: But if after Observations shall confirm the Remarks that have been now made, no doubt the Indication will be to preserve such a softness in all the Fibres, that they may easily yield to the pressure of the Blood, and by their Elasticity restore themselves to their former state, giving thereby a new *impetus* to the Blood.

IX. *The Construction and Properties of a new Quadratrix to the Hyperbola, By Mr . . . Perks. Communicated by Mr Abr. de Moivre, F. R. S.*

THe Circle, Ellipsis and Hyperbola being not Geometrically Quadrable (as infinite others) there have been two ways made use of to find their Area's. 1. By *Converging Series*, whereby Approaches are made nearer and nearer, according to the exactness desir'd. 2. By *Quadratics*, that is, Mechanical Curves, which determine the Length of certain Lines, whose Squares or Rectangles give the Area of the Figure desir'd. Of this sort is the old *Quadratrix of Dinostratus*, by which the Circle and Ellipse are squared; and another sort (for the same purpose) I inserted in the *Transactions* about 5 years ago. Since that, having found the Construction of a Curve, from whence (besides its own *Quadrature* and *Rectification*) the *Quadrature* of the *Hyperbola* is deriv'd, I thought the following Account might not (to some) be unacceptable.

Let A B, C D, be two straight Rulers joyned at B, and there making a right Angle. (Their length according to the largeness of the Figure you will describe.) E F is another Ruler somewhat longer than A B. Near the one end E, let a little *Truckle-wheel* (represented edge-wise by *g h*, and made of a thin Plate of Brass or Iron) be fastned to the Ruler by a Pin (*i*,) thorow its Center, so that the Wheel may turn about upon the Pin (*i*) tight to the Ruler without joggling.

On the under side of this Rular (the side from the Eye in the Scheme) let there be pinn'd or glewed a little piece of Wood (in the form of a Quadrant, the part which is seen being mark'd kl) whose edge (or limb) kl , is an arch of a Circle of Center (i ,) and Radius ib (the same with the little Wheel.) The design of this piece of Wood is, that in the several Positions of the Rular EF , the circular Limb kl always touching and sliding by the edge of the Rular AB , the Center of the Wheel may be always in a line (im) parallel to the Rular AB .

In the Rular CD make $MB = ib$ or ik , and at M fasten a little Pin, and another to the Rular EF near the Wheel, as at p . To these two Pins let be fastned the two ends of a String MR , so that its whole length (from Pin to Pin) $+ pi$, be equal to the intended Axis of the Curve TW .

The Instrument being thus prepar'd, let a strong Rular SO , be fastned (or held fast) upon the Paper or Plain that the Curve is to be drawn upon. Lay the Rular EF from M towards A , and parallel to AB , so that the String lye all straight along the edge of the Rular EF from M to p , the point Sk of the Quadrantal piece of Wood resting upon the edge of the Rular AB . Then with a small Pin at M keeping the String close to the edge of the Rular EF , and with your other hand upon the end E , keeping the Wheel tight to the Paper or Plain, move the Pin, String and Rular EF from M towards O , the Rular CD sliding along by the fastned Rular SO in a right line, the Wheel gh will by its motion describe the desired Curve TV .

Note,

Note, The Semi-diameter of the little Wheel must be about the *Sum* of the thickneses of the two Rulers E F and A B, that it may touch the Paper. Also it will be convenient that its edge be thin, and a little rough, that it may not slide flat-ways, and that it may leave a visible impression.

From this Construction the following Properties are demonstrable.

I. It is evident from the Construction, that the *Sum of the Tangent and Subtangent* is every where equal to the same given Line = $MR + Ri = TW$.) for the String (first straight at TW , afterwards making an Angle at R) being every where the same, the Line Ri (or $Rp + pi$) is always the Tangent, and the Remainder RM the Subtangent ; the Contact of the Wheel with the Plain, being the point of the Curve to which they belong.

II. It hence follows, that any assignable part of the Curve is *Rectifiable*, or equal to any assignable straight Line: In Fig. 2. Let FAE be a part of the Curve, its Vertex F . HDd is the Line described by the motion of the Pin R (in Fig. 1.) and may be shewn to be Asymptote to the Curve. FH a perpendicular to HD . Let A be given point in the Curve, AD the Tangent, and BD the Subtangent to the same point A . Let a be another point in the Curve infinitely near to A . to which let ad be the Tangent, and bd the Subtangent. Draw AG , ag perpendicular to FH and AB , ab perpendicular to HD . By the Construction $AD + DB = ad + db$. Let s be made equal to aD , and draw Ds . Then because $ad + bd = AD + DB$. Subtract bD and aD (or s) from both Sums (Equals from Equals) there remains $sd + dD = Aa + Bb$ (or Ca) AaC ,

Dd & are like Triangles (or differing infinitely little from such) therefore C a (B b) : A a :: a d : D d. and compounding B b + A a : A a :: a d + D d : D d. Alternating B b + A a : a d + D d :: A a : D d. But B b + A a = a d + D d (as is shewn above) therefore A a = D d. A a is the fluxional Particle of the Curve F A, and D d is the fluxional Particle of the Line H D; These Fluxions or Augments, being equal, and their flowing quantities beginning together, are themselves therefore equal, viz. F A = H D.

Let F G = x. G A (= H B) = y. A D = t. B D = S. So is the Curve F A = H D = y + S; that is, the Curve from the Vertex to any given point therein, is equal to the Sum of its Ordinate, and Subtangent to the same point which is its second Property.

III. The next Property (and whereupon I call it the *Hyperbolic Quadratrix*) is this, In Fig. 2. let F A E be a part of the Curve, (&c. as before.) F I K H is a Square upon the line F H. Δ I L is an Equilateral Hyperbola whose Vertex is I, its Asymptotes H O, H R. its Ax H I μ . From a given point L in the Hyperbola (below its Vertex I) draw L A parallel to the Asymptote R H, intersecting the Diagonal I H in M, F H in G, and touching the Quadratrix in A. I say, that the Hyperbolic Area I L M is equal to a Rectangle, whose sides are the Ordinate G A, and twice F H, the Ax to the Quadratrix, that is, Trilin. I L M = 2 F H * G A.

Let F H = a, F G = x, G A = y. Because of the Hyperbola G L X G H (L S) = F R q. therefore G L = $\frac{F H q}{G H}$; and L M = $\frac{F H q}{G H}$ — G H (M G) that is,

$$L M = \frac{a a}{a - x} - a + x = \frac{2 a x - x x}{a - x}, \text{ and consequently}$$

the fluxion of the Area I L M = $\frac{2 a x - x x}{a - x} \cdot \frac{a}{a - x}$

In the Rectangle triangle A D B, $AB = a - x$, $BD = S$, $AD = r = a - S$; then is $AD^2 = AB^2 + BD^2$: or $a^2 - 2ax + x^2 = a^2 - 2ax + x^2 + S^2$, which being reduced, gives $S = \frac{2ax - xx}{2a}$

Let la be a right line supposed infinitely near and parallel to LA , and intersecting AB in C . Because of like triangles ACa , ABD ; $AB : BD :: AC : Ca$ that is $a - x : S (= \frac{2ax - xx}{2a}) :: \dot{x} : \dot{y}$. therefore $\dot{y} =$

$\frac{2ax - xx}{2a} \dot{x}$. Multiply each by $2a$, and 'tis $2a\dot{y} = \frac{2ax - xx}{a} \dot{x}$. The *Flowing quantity* of $2a\dot{y}$ is $2a\dot{y}$

and the *flowing quantity* of $\frac{2ax - xx}{a} \dot{x}$ is the Hyperbolic

Area ILM (as is shewn before.) These two Area's beginning together at F and I , and having every where equal *Fluxions*, or Augments, are therefore themselves every where equal.

N. The Quadrature of the Trilinear Figure ILM being thus found, any other Area bounded with the Curve line IL and any other Right Lines is also given.

IV. Supposing the same things as in the precedent Proposition, I say, that the Area of the Quadratrix $FabHF$ is equal to half the square of Fg , wanting the Cube of

Fg divided by six FH , or $FabHF = \frac{xx}{x} - \frac{xxx}{6a}$. The

Fluxion of this Area is the Rectangle $CabB = a - x \times \dot{y} = a - x \times \frac{2ax - xx}{2a} \dot{x} = x\dot{x} - \frac{xx}{2a} \dot{x}$. The

flowing quantity of $x\dot{x}$ is $\frac{1}{2}xx$: And the flowing quantity

tity of $\frac{x x}{2 a}$ is $\frac{x x x}{6 a}$ [as is easily shewn by bringing back these flowing quantities to their respective Fluxions.] And hence also it follows, that the whole Area continued on infinitely towards F , is *one third of the Square F I K H*; or $\frac{1}{3} a a$. For supposing $x = a$ the Area above becomes $\frac{a a}{2} - \frac{a a}{6} = \frac{a a}{3}$.

While I was considering the other Properties of this Curve, and had given some account of them to my Ingenious Friend Mr *John Colson*, he returned me a Letter with the Addition of the Quadrature of the Curves Area, which I had not then enquired into:

V. Supposing still the same things, I say that the Solid made by the conversion of the Area $F a b H F$ about the Line $H b$ as an Axis, is equal to a Cylinder whose Radius is $F H = a$, and height equal to $\frac{x x}{2 a} - \frac{x^3}{2 a a} + \frac{x^4}{8 a^3}$. And the whole Solid made by conversion of the whole Figure infinitely continued, is equal to an eighth part of a Cylinder, whose Radius and Height are each equal to $F H$ or a .

Let $\frac{P}{D}$ express the Proportion of the Periforie and Diameter of a Circle. Then is $\frac{P}{D} a b$ quad. the Area of a Circle whose Radius is a . And because $C a = \dot{y} = x - \frac{x x}{2 a x}$ the fluxion of the Solid is $\frac{P}{D} a b. q. \times \frac{x - x x}{2 a x}$

or

$$\text{or } \frac{P}{D} a - x^2 \cdot \frac{x - \frac{x x}{2 a}}{a - x} = \frac{P}{D} a x - \frac{3}{2} x x + \frac{x^3}{2 a x}$$

whose flowing quantity is $\frac{P}{D} a x x - \frac{x x x}{2} +$

$\frac{x^4}{8 a}$. Which Solid being divided by $\frac{P}{D} a a$ (the Area

of a Circle whose Radius is a) gives $\frac{x x}{2 a} - \frac{x x x}{2 a a} + \frac{x^4}{8 a a}$

for the height of a Cylinder on the said circular Base, and equal to the Solid made by conversion of the Area $F a b H F$ about the Line $H b$ as an Axis. When $x = a$ (that is when the whole Figure is turn'd about its Asymptote) the height $\frac{x x}{2 a} - \frac{x^3}{2 a a} + \frac{x^4}{8 a a}$ become $\frac{1}{8} a$

VI. The Curve surface of the Solid generated by the Conversion of the Figure $F a b H F$ about $H B$, is equal to the Curve surface of a Cylinder whose Radius is a , and height equal to $\frac{x}{2} - \frac{x x}{4 a} + \frac{x x x}{12 a a}$. And the whole Curve Surface of the Solid infinitely continued, is equal to *one third part of the Curve Surface of a Cylinder whose Radius and Height are equal to $F H$ or a .* Which may be demonstrated after the manner of the precedent Proposition.

VII. The Radius of the Curvature of any Particle of the Quadratrix is $\frac{a^2}{a - x}$ and this found Geometrically.

In Fig. 3. $F A E$ is the Quadratrix, $H D$ the Asymptote, $A D$ the Tangent, $B D$ the Subtangent to a given point A . Make $B V = A D$. Upon V rise the perpendicular $V W$. from A draw $A W$ perpendicular to the Tangent $A D$, till it

it meet A W in W. So is A W the Radius of the Curvature at A.

VIII. This Curve may be continued on infinitely above the point F (but by a different and more operose way of Construction) whose Properties will be these. 1. The *Difference* of its Tangent and Subtangent (taking the Subtangent in the Line H S) will be always equal to the same given Line F H or a . That is, as $t + s = a$, below F, so $t - s = a$ above F. 2. As below F the Curve Line is equal to the *Sum* of its Ordinate and Subtangent, so above, it is equal to their *Difference* or $-S - y$. 3. As below F, $2 a y = I L M$, so above $2 a y = I \lambda \mu$. All which (and its other Properties) may be demonstrated as the Precedent *mutatis mutandis*.

IX. With a little variation in the precedent Construction may the *Logarithmick Curve* be constructed, which is also a *Quadratrix* to the Hyperbola. In Fig. 1. omitting the String M R P, let the distance M R be equal to the *Subtangent* of the intended Logarithmick Curve (which, as 'tis known, is invariable.) Stick a Pin at R in the Rular C D, to which apply the Rular E F, so that the edge of the little Quadrant $k l$, resting upon the Rular A B, the distance M i be equal to M R. Then keeping the Rular E F tight to the Pin R and Rular A B, slide the Rular C D along in a straight Line (by the Rular or Line S O.) So will the Wheel $g h$ describe a part of the Logarithmick Curve T V, whose *Subtangent* is every where M R.

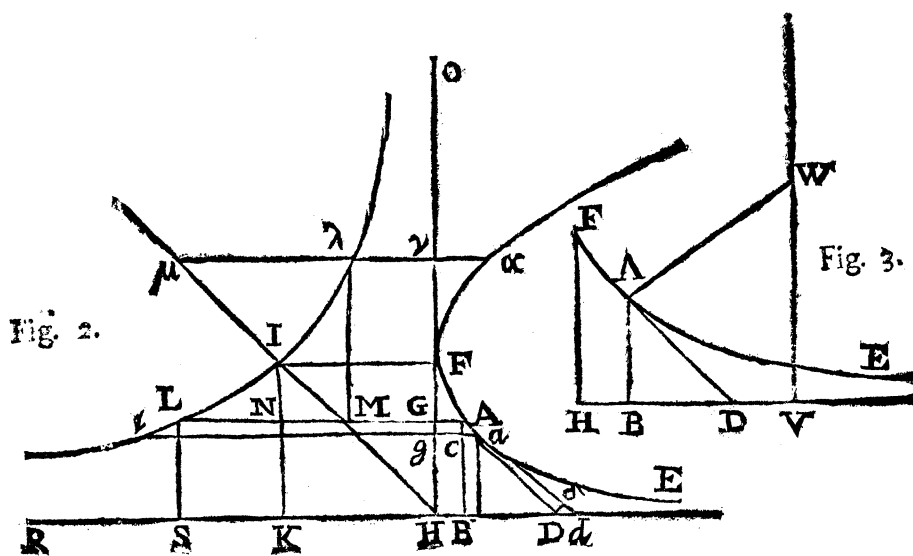
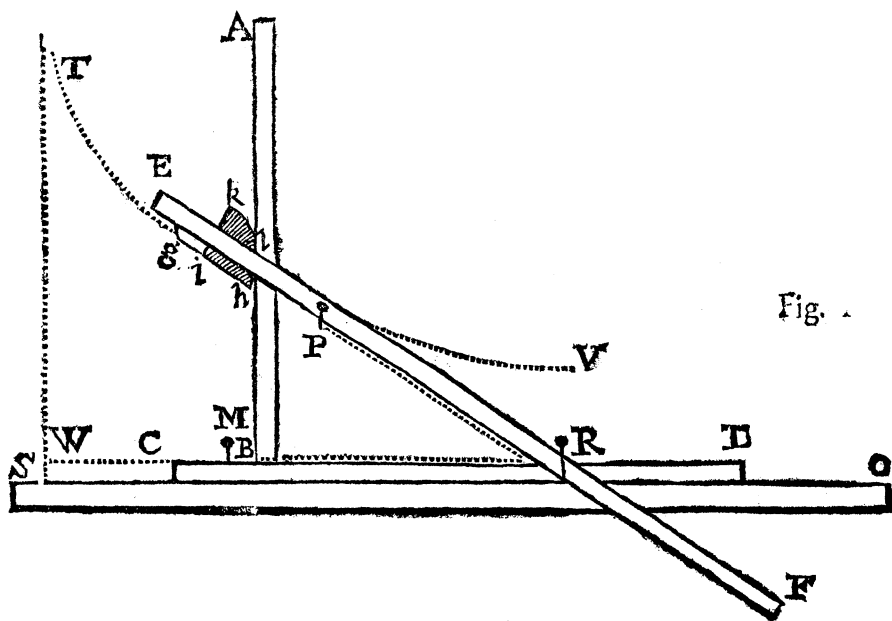
X. Fig. 2. Let F A E represent the *Logarithmick Curve*, whose Subtangent is equal to F H. L I A is an Equilateral Hyperbola (*Or* as before § III.) Let $F G = x$, $G a = y$. $F H (= B D) = a$. $G H (= L S) = a - x$. $A C = x$. $C a = y$. Then $A C : C a :: A B : B D$. that is $x : y :: a$
— x

$x : a :: a : \frac{a^2}{a - x}$, therefore $a \dot{y} = \frac{a^2}{a - x} \dot{x}$. The

Flowing quantity of $a \dot{y}$ is $a \dot{y}$; and the *Flowing quantity* of $\frac{a^2}{a - x} \dot{x}$ is the Hyperbolick Area F I L G (for by the

nature of the Hyperbola $GL = \frac{a^2}{a - x}$) therefore is

the Hyperbolick Area F I L G equal to $a y$, a Rectangle whose sides are the Subtangent (B D = F H) and Ordinate G A (as here accounted) of the Logarithmick Curve.



An Account of a Book, Entitled

X. Samuelis Dale *Pharmacologiae seu Manuductionis ad Materiam Medicam Supplementum : Medicamenta Officinalia simplicia, priore Libro omissa, complectens : Ut & Notas Generum Characteristicas, Specierum Synonyma, Differentias, & Vires. Cum duplici Indice, generali altero Nominum & Synonymorum precipuorum, altero Anglico-Latino, in gratiam Tyronum.*

IN the year 1693 our Author published his *Pharmacologia seu Manuductio ad Materiam Medicam*, of which an Account was given in these *Transactions*, (viz.) N. 204. pag. 929. After the publishing of which, he observed an Increase of the *Materia Medica*, many Medicinal Simples being used in the Shops, and likewise he met with several Books relating thereto, which either were not then published, or had not come to his knowledge before. And our Author having also received advice from divers Ingenious persons, who had travelled into Foreign Countries, that his aforesaid Book was well received, not only in *France* and *Holland*, but likewise in *Italy* and the remoter parts of *Germany*, made him think a Supplement necessary to render it more useful to other Countries : And because it has extended its progress to the Neighbourhood of *Greece*, that ancient Fountain of Learning, he concluded, that it would not be improper to add out of *Dioscorides* and the Foreign Dispensatories, all those things which he had omitted publishing : And that in a

Book by themselves, without staying for the reprinting of the former Book.

Our Author had made a considerable Progress in his design, when he received advice that Monsieur *Tournefort* was, by the *French Kings Order*, gone into *Greece* and the adjacent Islands, in search of Plants, especially those of *Dioscorides*; this occasioned him to stop the prosecution of his Work for some years, in hopes that great and accurate Botanist would upon his return gratifie the Curious with his Discoveries of the true and genuine Plants of the Ancient *Grecians*, which had perplexed the Herbarists of our late Ages.

In this Supplement our Author took care to set the *Materia Medica* of *Dioscorides* in a clear light; and for that end consulted all the Authors that he could meet with upon that subject, keeping as close as he could to his Text, in which he chiefly adhered to the Translation and Commentary of *Matthiolum*. And because in this performance he travelled in an untrodden path, knowing of no precedent in any Language, he therefore consulted both the Dead and Living, (*i. e.*) not only Books, but many Persons of Ingenuity and Learning. The nature of the Work requiring the Virtues of each Simple to be annexed, and the design of the Book requiring Brevity, he chose to transcribe them from Authors, which had already contracted to his hand; but at the same time, to avoid the Imputation of *Plagiarism*, he at the end of every Transcription inserted the Name of the respective Author: Nor did he think it any discredit to him, that he had the assistance of others, but rather a Glory, and therefore doth throughout the Work acknowledge the Persons he had advice from.

This Book being only a Supplement to the former Work, as I said before, is divided according to the same method, and therefore need not here to repeat it. But then perhaps to give

give a short account of some things in the Work it self. In the first Book of which, our Author in the Chapter of Waters takes notice, that *Cold Baths* were in use among the Ancients in the Cure of many Diseases; and that they are commended by divers Learned Physicians, and especially by Sir *John Floyer*, Kt, and *Dr Baynard*; the first of which, in his Excellent *Πυχελαια*, hath enumerated the several sorts of Cold-Baths, and the many Cures perform'd by them. He likewise takes notice of the divers ways of making *Salt* from *Sea-Water*; first by insolation only, as *Bay Salt*, the Sea-Water being in hot Countries grained in Pans called *Salt-Marshes*; 2dly, partly by the Sun, and partly by Fire, as *Port-Sea-Salt* at *Limmington* in *Hampshire*; 3dly, by Boiling only, as *Newcastle* and *Scotch Salt*. To these he adds the manner of making Salt from Sea-Sand in *Lancashire* and other places; and likewise observes, that both *Speed* and *Camden* did take notice of the Evaporation of Sea Water into Salt, by the Sun, in the hollows of certain Stones in the Bishoprick of *Durham*.

In the Chapter of Mineral Waters, he takes notice of their several divisions and sorts made by his Neighbour *Mr Allen*, in his Book of the *Chalybeat and Purging Waters* in England. And in the Chapter of Salts, besides many Curious Notes concerning the Crystals of *Salt*, *Salt-Gem*, *Niter*, *Allum*, and *Vitriol* excerpted from the *Exercitationes de Fontibus Medicatis Angliæ*, of his Learned Friend *Dr Martin Lister*; he takes notice of a sort of Salt made at *Maldon* in *Essex*, called *Salt upon Salt*, by the dissolving *Rock Salt* found in *Cheshire*, in Sea Water.

In the Chapter of Stones, our Author observes, that the *Adarce* of *Dr Plot* is nothing but an Incrustation, occasioned upon the mixing a *Chalybeat* Water near its source with another from a gravelly soil, which by diluting the first, causes the precipitation.

In the 2d Book our Author shews that the *Poco Sen-
pie*, or *Golden Moss*, of *Dr Grew*, so celebrated in an
Hæmoptysis, is only the Down of the Root of a sort of
Fern, growing in *Tartary* or *China*; which Root he con-
jectures to be the *Agnus Scythicus*, of which Authors
write so many Fabulous Stories. He enumerates the
many Controversies among Botanick Authors about
Wormseed, concluding it to be the Seed of a sort of
Wormwood. The famous *Cylonian Plant* against Deafness,
of *Mr Marlow*, he affirms to be a sort of Mint; *Ipecacu-
anha* to be the Root of an *American Herb*, near a kind
to the *Herba Paris*: *Anisum Judicum* to be the Seed-
Vessel of a sort of *Fraxinella*. The *Star of the Earth*,
(so call'd,) in a famous Receipt against the biting of
Mad-Dogs, he proves to be the *Coronopus*, and not the
Sesamoides Salamanticum Magnum, which some mistake it
for. *Soia*, of which *Ketchup* is made, is the Seed of an
Indian Phaseolus; as *Angola Seeds* are those of an *Abrus*,
and *Russia Seed* of the *Gramen Manna*. *Salep*, *Cassum-
muniar* and *Dart wort*, are 3 Roots; the first of a sort of
Orchis, the second of a Species of *Galanga*, and the last
of an *Indian Reed*.

In the *Dendrology* our Author demonstrates *Palm-Oyl*
to be made of the Fruit of an *African Palm-tree*: *Mal-
diva*, and *Malabar-Nuts* to be likewise the Fruits of two
Indian Palms, as *Sage* is the feces of the Pitch of ano-
ther *Palm* granulated. He observes the various sorts of
Dragons Blood now to be found in the Shops; and gives
a farther account of the Tree which yields the famous
Peruvian Bark. He acquaints us what Trees or Shrubs
they are which do produce the Simples published by the
late *Mr Marlow*, under the feigned titles of *Virginia* and
Molucca Nuts, *Bengala Beans* and *Bermudos Berries*, *Cas-
sina*, and *Perygna*. The *Faba Sancti Ignatii* he proves to
be a sort of *Nux Vomica*.

In the third and last Book, our Author gives some farther account of the *Cochinele*, proving it to be of animal production, and that it is not any of *English Lady-cow*, as some have affirm'd : The *Glossopetra* he believes to be the petrified Teeth of Sharks. Concerning the *Serpentine stone*, he takes notice of the difference in Authors about it, *viz.* whether it is a Natural or Artificial production, and whether it hath the Virtue to expel Poison in Venemous bites or not? He enumerates the several assertions of the Learned *pro & con*, quoting divers of their Experiments, and at last concludes, that both Natural and Artificial are to be met with, and that the different operations must arise from thence. *Pedro del porco* our Author affirms to be only an *Ægagropila* found in the Stomach of a *Porcupine*. To these he adds some Observations taken from *F. Camilli* his Papers, not only concerning this Stone, but likewise *Bezoars*. The whole Book abounds with many Curious Observations, for the farther dilucidation of the *Materia Medica*, which we recommend to the perusal of the Curious:

London, Printed for Sam. Smith and Benj. Walford, Printers to the Royal Society, at the *Prince's Arms* in *St Paul's Church-yard*, 1706.

ERRATA.

B. In *Philos. Transact.* N. 305. Page 2195. Line 31. read *vir* VIII as well as IX.

PHILOSOPHICAL TRANSACTIONS.

For the Months of July, August and September, 1706.

The CONTENTS.

- I. *De Monstris, quasi Monstris & Monstrosis ; item de Serpentibus, &c. Philippensibus, ex MS. R. P. Geo. Jos. Camelli. Communicavit D. Jac. Petiver. Pharmacop. Lond. & S. R. S.*
- II. *An Account of an Experiment made before the Royal Society at Gresham College, together with a Repetition of the same, touching the Production of a Considerable Light upon a slight Attrition of the Hands on a Glass Globe Exhausted of its Air : With other Remarkable Occurrences. By Mr Fra. Hauksbee, F. R. S.*
- III. *A Letter from Mr Samuel Dale to Dr Hans Sloane, R. S. Secr. giving an Account of what Manuscripts were left by the Reverend Mr John Ray, together with some Anatomical Observations made at Padua by the said Mr Ray.*
- IV. *Of Hydatides inclosed with a Stony Crust in the Kidney of a Sheep. By Mr W. Cowper, F. R. S.*
- V. *Microscopical Observations on the Structure of the Spleen, and the Proboscis of a Flea. By Mr Anthony Van Leeuwenhoek, F. R. S.*

I. *De Monsttris, quasi Monsttris & Monstrosis ; item de Serpentibus, &c. Philippensibus, ex MS. R. P. Geo. Jos. Camelli. Communicavit D. Jac. Petiver. Pharmacop. Lond. & S. R. S.*

1. **I** Ndi *Abayan* Uxor enixa est puerum A. D. 1695. 'in Vico Palo Insulæ Carigaræ *Bysaiarum*, facie *Testudinis Marinae*, & testæ ejusdem tessellis in cute expressis : Anno verò insequenti alterum similem dicto.

2. *D. Maria Quiros* enixa est *Mariam* post duodecimum, *Josepham* post decimum tertium, *Emanulem* post decimum quartum mensem, qui natus est bino dente. *Manila.*

3. *D. Elizabetha Guevana*, Gravida quotiescunque, menstruabat ac si utero non gereret, imò si tempore gestationis sanguis non mittebatur, inflata & tumens suffocabatur, & manibus pedibusque ex plethora paralytica fiebat, & demùm abortiebatur. Proles verò non obstante fluxu menstruo, & sanguinis missione enixa est 12, 13, & 14 mense, quadratos, & bene conformatos. *Manila.*

4. Uxor *D. F. Montenegro* enixa est puellum coloris *Æthiopis* ; obstetrix prudens suspicata malaciæ, aut picæ præcedentis effectum, rogavit num elapsis diebus aliquid appetierit, quod non concessum fuerit, & certior facta appetiisse paulo ante partum *Sardinas*, quas in ejus conspectu *Æthiopissa* edebat, tulit de *Sardinis* ossa & reliquias, & puerulo os reficuit, & sine morâ color adustus in candidulum transmutatus est. Hic diem ætatis virilis, ex vehementi animi passione, & conflictu, unicâ nocte omnino incanuit. *Manila.*

5. *Pueros tres vivos peperit uno partu in Suburbio S. Crucis A. D. 2699. Sino-Inda.*

6. *Æthiopes tres vivos peperit uno partu & Æthiopissa Ana A. D. 1692. Mayhalique.*

Monstra quæ existerant A. D. 1700. in Insula Catanduan.

7. *Joannes de Flores*, Vir cæterum bene formatus, monstruosa habet *Brachia*, quæ vix non crassitudinis sunt *Femoris*, Manus verò digitis ferme triplo longiores ordinarijs, in quibus tres digiti medij coaluere.

8. *Martinus Suniga* Puer a nativitate mutus, laborans antipathia *Anri*, ad cujus præsentiam miserrimè convulsionibus torquetur, ad inaurata verò non patitur.

9. *Puella*, cui *Mammæ* loco propendent gœna usque duo quasi carnea forcimina, æqualia ab exortu usque ad extremum.

10. *Martina*, Puella ventriloqua, sentit internè sæpissimè quod nec ipsa explicare valet, & tunc immota illa, vox interna distincta, & tenuis, loquitur & respondet varijs linguis. *Dæmon* illusor esse videtur, sacris exorcismis non paret, sacras recitat Orationes, illa ipsa vox interna Puellæ non est damno; futura, & ignota, alia prædicit, alia nescit.

11. *Vacca Hermaphrodita Indis Talos*. Homines androgynos *Binabaye* vocant & *Binoje*.

12. *Vitulus* domi *D. Francisci de Quiros* natus unicornis: Cornu est Bovinum, sed rectum de medio frontis exiens: Facies nec benè Vituli, nec benè Hinnuli. *Equos* verò *Insula* non alit.

13. *Albinam*, Hispanis *Albinno*, vidi *Manila*: erat Puella decennis (proles *Morenorum* parentum, qui coloris sunt fuliginosi, sed capillitio protenso) albedinis extraordinariæ & insolitæ in admirationem trahentis, & monstruosæ, capilli aureoli, solem ac lucem invitè ferens. Causam vulgus non phantasiæ sed Lunæ influxui tribuit.

14. In

14. In *Mindoro* Insula vico *Camaron* Nigrita primo partu enixa est puerum unum, secundo geminos, tertio trigeminos, & nunc A.D. 1700. utero gerit.

15. *Homines caudatos* reperiri ferunt in Mediterraneis *Paynan*.

Ex Historia *Bysaiarum* MS. Ignatij Alzinæ.

16. In Vico *Tubig* Provinciæ *Pictorum*, Uxor Indi *Pacaton*, eodem partu post enixam puellam, peperit & *Crocodilum*, longitudinis cubitalis, quem maritus recisa caudæ parte in fluvium projecit; hic dein ferme omni nocte fluvium egressus sub domum veniebat, imò transmigrando post biennium in alium vicum distantem duobus miliaribus, uterinam Sororem Frater *Crocodilus* sequutus fuit. Tandem Sororem fugientem ab invito Fratre in cæto miliaribus distantem vicum *Borongam* frater sequutus est; post 31 annum verò adhuc vivebat uterque, imò multoties *Aprôs*, *Cervos*, *Testudines Marinas*, aut *Pisces* majores Sorori noctu ad domum defererebat. *Ign. Alzina Lib. 1. cap. 9.* H. Byf. MS. In vico *Calviga* Provinciæ *Bysaiarum*, Inda enixo puero sano & bene disposito enixa est & *Serpentem*, longitudinis sesquipalmaris, crassitie digitalis, rubrum a capite ad medium, a medio usque in caudam nigrum, squamis relucens, qui pro tunc defugit, & latuit; die verò tertiâ, & postea multoties inventus fuit ad latus Pueri, ita ut mater coacta fuerit aliò transmigrare, ut puerum à persecutore fratre Serpente liberaret. *J. Alz. l. 3. c. 12. MS.*

18. Gigantes *Tuia* vocant; extitisse in *Igbabaa*, cum Uxore & Filiis, nomine *Morongboronga*, constans est fama.

19. Alium in *Gimasava*, nomine *Pusung*.

20. Gigantum tibie inventæ fuere in *Bulilacu*, circumferentiæ duarum spithamarum, longitudinis Orgyalis.

21. Exi-

21. Existere in hodiernum in montibus Mediterraneis *Caraga*, & in insulis jacentibus contra caput *Sancti Augustini* ubi visi sunt. In montibus *Gigantum* inter & *Borongar* inventa sunt vestigia pedum triplò majora hominis ordinarij.

22. *Pygmaeos* non Monstruosos sed benè formatos vocant *Bongan* & *Malypoto*. Hi cubitales interfecere Gigantem *Pusung* in *Calviga*.

23. Circa vicum *Bislic*, Insulae *Mindanao* venatores invenerunt Puellam spithameam, vagientem, benè dispositam, quæ baptizata die tertiâ expiravit. Visi sunt sæpius in desertis & ab alijs non inhabitatis Insulis *Siargao* & *Miargao*.

24. *Pygmaeos* defectuosos, seu Monstrosos vocant *Munti Suman* & *Pandacan*, Hispani *Enanos*. Maglonos *Panbubanus*. Altitudinis erat quinque spithameæ, benè proportionatus, verùm Monstruosè quadratus. Balico *Tambucensis* ejusdem staturæ, impropportionatus, sed robustus & magnarum virium.

25. *Dulacensis* corpore pueri Sexennis, gracilis vixit annis 40, *Manile*. Ubi nunc mas unus, & duæ foeminae.

26. In colonia *Panayensi* ex parentibus *Indis*, staturæ proportionatæ nata & baptizata est Anno 1685. Pigmea nomine *Anna*, non monstruosa, sed benè conformata & & proportionata quæ Anno præsentis 1703 vivit & altitudinis est palmi unius & trium digitorum, loquitur, & omnes rationales obit functiones, vivit cremore *Oryzæ* cui cum habetur additur *Semen Cucurbitæ*. Prior *Panayensis* R. P. *Josephus Trepad* parentes unâ cum Pigmea filia proxime *Manilam* deducere tentaverat, sed hac de causa sublevata Provincia ferè hostiliter resistit, Parentes verò cum filia in montes profugere, ubi in hodiernum cum *Indis* necdum reductis degunt, & quo Hispani hocce Naturæ miraculum videndi gratia sese conferunt. Hæc ex relatione *Emanuelis Rodriguez de Leon* qui supradictæ P. Priori *Panayensi* convixerat.

27. *Indus* viginti quatuor digitorum.

28. *Indus* alius, digitis carens, habens eos in Pedibus.

29. *Indus* alius, carens digitis in Pedibus habens eos in Manibus.

30. *Indus* alius, excepto pollice, reliquos habet concretos.

31. *Catao* Monstrum est Marinum Tritonium, formæ *Hominis*, quorum unum Mortuum inventum fuit Masculum. Voces vero, & Ejulatus eorum sæpius audiuntur, & ipsa non raro visuntur circa Insulam *Dinacat*, qui inter *Leyte* & *Mindanao* sita est, ex vestigiis luto impressis, & emortui forma constat inter divaricatos Manuum, & pedum digitos Membras habere *Anatum* modo.

32. *Ognima* & *Talonganum*, Indi vocant Monstra Figuræ humanæ pilosa, fera & terrifica. Visa sunt ut refert *Alphonsus de Mentrída* Anno 1599. & 1600. multa, in montibus *Provinciae Ybabay* & *Aclan*, formæ Satyrorum, Faunorum & Silenorum.

33. *Onglo* & *Tigbalan*, Nescio quid Spectri, formæ *Æthiopis*, staturæ *Giganteæ*, muties puellas & pueros in Deserta abducens. Qui reduces, vel casu inventi, quasi terrore panico perculsi ad omnia stupent, & attoniti hærent.

34. *Additamentum in adnotationes* de Monstris quas tibi Anno elapso Mens. Octobri misi.

35. Monstrum *Philippense* Centauri facie GAZ. NAT. Tab. 45. fig. 4.

Monstrum *Catbaloganum*, enixa est Mulier *Tinampay* vocata, Anno 1678. Vixit circiter horæ quadrantem, & extinctum est. Multiforme erat & terribilis visu formæ: *Rostrum* erat quasi *Ardeæ*: *Vultus* & *Aures Cervi*, *Collum* longum *Cervinum* & pilorum loco setis *Equinis* hirtum, *Dorsum* & *Pectus* & reliquæ usque in lumbis *Hominis* erant, sed confitis plumis variarum cognitarum *Avium*; *Brachia* & *Manus* prouti & crura trium juncturarum, digiti

Ma-

Manuum *Cercopitheci*, unguum *Felis*, aut *Falconis*, & digitos inter, Membranæ intergerrinæ ut pedum *Anatis*, Nates conchæ Testudinis Marinæ modo maculosæ tessellatevè: Fœmora & crura Cervina in bifurcas ungulas desinentia, verum pilo vario, variorum Animalium ut Equi, Vaccæ, Cervi, Felis, Canis, *Sauræ*, Muris Vespertilionis & aliorum, quas interpolatim refarcita. Communicavit *Franciscus* de la Zarza qui vivum vidit eadem confirmat *D. Franciscus* de *Aluaga*, qui eo tempore illam provinciam administrabat, & mortuum vidit. Addendo *Iudum* ex quo dicta Mulier conceperat fuisse Magum.

36. *Manila* Anno 1693. in domo *Joannis* de *Mena*, Scrophia peperit nephrendem cui aures majores *Equinæ*, vultus sepidus, ridiculæ vetulæ, nates in longam *Elephantinam* proboscidem protensæ.

37. Puer *Baclayonensis* *Boholanus* Anno 1700. Ostentis erat, Gigas futurus, si infantiam, & corporis proportionem, & vires spectamus. Triennis siquidem uno prandio 4 & 5 lagenas *Tubæ* ebibebat, Succus est ludico vinosus *Nucis Indicæ Cocci*, & tantum radicis *Ube* assæ, aut coctæ, est species hujatis *Batetæ*, edebat, quantum senis robustis *Iudis* dapsiliter sufficeret. Vires proportioni corporis, & copię nutrimenti correspondent, jocando etenim & ludendo domus Indorum tametsi columnationis fortissimarum arborum, nutare & contremiscere facit. Scripsit *F. Antonius* de la Zarza, qui puerum vidit.

38. *Draco* cristatus, alatus tetrapus. GAZOPH. NAT. GAZ. NAT. Tab. 85. Fig.
Tab. 85. Fig. cum Anno 1703. 23 Martii cum *R. P. Joachymo Assin*, & aliis circiter 20 itineris Sociis per æstuarium *Panayense*, Capis versus veheremur, obviam habuimus in ipso æstuario littore saxo incumbensentem Draconem formæ sequentis, Longitudinis erat prope *Orgyialis*, altitudinis unâ cum pedibus & spinæ dorsi crista duobus dodrantibus majoris, crassitudinis fœmore amplioris. Caput habebat *Leoninum*, album oculorum coloris xerampelini, iridem

sulphuream, pupillam aterrimam; *Labium* inferius flavo-pallescent, supernum lutescent: *Fauces* tingentes duobus candicantium dentium ordinibus stipatas, *Linguam* rubentem. *Pectus* erat amplum, & corpore torosius: *Alæ* binæ & corporis trunco longitudine suppare, membranaceam *Vespertilionum* modo, in extremis lunatim angulosæ atq; plumatim nigro, viridi, xerampelino, & flavo picturata. Corporis potior pars viridi colorata: *Dorsum* a collo usq; in caudæ exordium, angulosè, palmam alta, membranacea, nigra & ad summities carneolè rubente cristâ alarum. Tergi latera usq; ad caudæ medium intercurrentibus lineolis albis, majusculè seu Conchæformiter maculosa, maculis intervenientibus strijs nigerrimis in tæniâs flavas, virides & xerampelinas, desinentibus variegata. *Venter* nigro & albo striatus erat. *Pedes* quatuor, curti quales sunt *Galli*, proportionatè crassi, verum quilibet tribus albis & aduncis unguibus, duobus antrorsum & uno retrorsum reflexo, donatus. *Cauda* crassa, obtusa, bipalmaris & quasi conchis aut squammis nigris & virentibus commaculata. Hæc pariter ex relatione *Emanuelis Rodriguez* de *Leon* Pictoris eminentis, qui vidit, narravit & *Iconem* exhibuit: Eadem confirmant & *Socij*.

De Serpentibus, Viperis, Scolopendris, Julis, &c.

39. *Pangavasum*. -Serpens coloris terrei, ad ventrem flavus, mortiferus; *Remedium* rad. Arboris *Pangavason*.

40. *Ibingan*. Vipera mortifera. *Remedium* reticula *Salagsalag*.

41. *Dumorogonon*. Serpens aterrimus, ventre cinereus, terroscissimus quandoq; crassitudinis fæmoralis.

42. *Mamlalaiog*. Coluber variè picturatus, venenatus, & perniciosus: Velocissimè saltuatim progreditur, volare diceret, capite erecto, & majore parte corporis erecta.

43. *Tigu*. Serpens, degit in Aqua & Terra, de quo narrant, quod ictus si auxilium petat, venenum in illo qui icto respondit transeat: Ut de aliis quod Venenum eorum per baculum quo percussi fuerunt, transeat in Brachium.

44. *Olopong*. est Serpentum genere habetur pro venenocissimo. *Vipera* Major Hispanâ.

45. *Dajondubu*. *Serpens* viridis, coloris foliorum *Cannæ Sacchariferae*.

46. *Talboftabo*. *Serpens* viridis venenosissimus.

47. *Dajon palay*. *Serpens* virens coloris foliorum *Orizæ*.

48. *Patongayta*. *Vipera* ex nigro varia.

49. *Tacquib*. *Serpens* aquaticus, furdaster innocuus.

50. *Tuna Bys*. *Udtu Tag*. *Vipercola* est semper sub terra degens, magnitudinis Lumbrici terrestris, sed gracilior vivissima, mille gyris ac rotationibus quàm ocissime sese subducens, coloris fulvi & splendentis; oculos nec Microscopio deprehendere potui: Demorsis somnum inducere ferunt.

51. *Dapung*. *Vipera* species *Tunæ*, coloris atro virentis, crassitudinis digitalis, longitudinis spithameæ, magno & improporcionato capite, perniciosissima.

52. *Buracan*. *Vipera* species *Tunæ*, coloris virentis *Buracan* crassitudinis digiti auricularis brevis, tarda & pigra, minùs perniciosa quàm *Bupung*.

53. *Calapiun*. Squammis nigris & flavis variata, venenosa & tardigrada.

54. *Bayo Vipera* a cujus ictu mortifero, oculi & saliva seu spuma virent, ut succus Herbarum.

55. *Ottohan Vipera* parva, tenuis, variè picturata, species *Ibingan*; Mortem inferens ictu ante solis occasum. *Remedium* Excrementum Hnmanum epotum. Ictus per noctem computescit, ut mane non nisi in partes distractus tolli possit. *Indus* ab ea ictus, evasit devorata dimidia

dimidia reticula *Salagsalag*. Pariter & *Inda* ab ea demorsa sanata est devoratis binis reticulis *Salagsalag*.

56. Ongor *Vipera* omnium venenossima.

57. Taligatos *Vipera* alia.

58. Viperulam in ovo Galli formatam invenit *Laurentius Pais Sagareni* Anno 1699.

59. Antonius *Ruizius* de Montoya in *Historia de Paraguay* scribit Serpentes transformari in Arbores & lapidibus aglutinari.

60. De ortu *Guajaci* ex Scarabæo vid. l. 3. p. 94.

61. Nec *Scandovalium*, nec *Montoyam* legi, ita mihi retulere qui hæc in eis legerunt. *Encalada & Merino*.

62. Cornu fragmentum spithameum, & digitos novem crassum vidi apud *Antonium Borjam* à quo dimidium dono habui, erat autem rectissimum, proportionem servatâ tricubitale ad minus, non in gyros retortum, ex tereti quasi obtusâ triangulare, solidum, & quasi pellucidum, coloris & ponderis cornu *Rhinocerotis*, subluteo fusci non nigri. an Unicornu verum.

63. Pro Cornu Serpentis dono habui Anno 1699. a D. *Emanuele Arguelles* ex Insula *Talim*, quæ est *Iacus Bay*, alatum; Cornu pyramidale, sesquiunciale, & fere unciæ latum parte sessili, album & quasi osseo-lapidum, solidum & ponderosum, & quod ni fallor cute obtectum fuit, ob subtiles strias supernè subasperum, inferne læve, ad latera ad unum latus inclinatis modicis binis prostantijs oblongis modicum angulosum. De hoc D. *Bened. Carasco* retulit se in chartis MS. legisse valere ad hæmorrhagias & signum legitimum Cornu Serpentis esse, si superpensum aquam dividat: Oblatum nil tale pateat. *Hieronymus Mercurialis* de signis veneni presentis scribit, Cornu Serpentis si teneatur in Mensâ, quo tempore venena adsunt, dicunt secretâ quadam Naturæ conditione protinus sudare &c. *Laurentius Forenus* in *Viridario Philosophico*, titulo *Sympathiæ & Antipathiæ*,
Mer-

Mercurialem citans scribit, signa veneni prognostica ; *Cornua Serpentis*, vel *Lingua* ejusdem sudet præsente veneno &c. de lingua *Mercurialis* nihil. An *Forerius* de lingua intelligat *Glossopetras* *Militenses* ? Vid. G A Z O - G A Z. N A T.
Tab. 91. Fig.
P I H Y L. N A T. & Artis Tab. 9. Fig.

64. *Alipihin*, *Olahipan*, vel *Lahipan* vel *Olalaipan Indorum*, est *Scolopendra terrestris*, *Hitpan*. *Cientopies*. Non tamen 100 sed 50 tantum habet pedes ; Est illa quam *Matthiolus* depingit *Constantinopoli* alatham : Corpus & pedes flavescent, articulatae incisiones in dorso nigrae sunt, corpus cum mystacis ex croceo rubent. Morsu dolorifica est, & male curabilia causat ulcera, à quibus præservat *Amomum* legitimum *Dioscoridis* ; Masti- catum & impositum ; cauterium actuale, *Allium* affrica- tum, & rasura *Ligni Molavin* imposita ; quandoque di- gitum auricularem crassa & spithamâ longior visitur, fusco, luteo, rubente, & viridante variat colore.

65. *Atipapalo* vel *Campopalo Indorum* est *Scolopen- dra Millepeda noctilucens*, ut *Cicindela*, seu *Noctiluca Brueri*, *Oviedi* & *Cordi*. Teres est, Coloris cyaneo viridescens, multipes ; Equos mactat, si in pabulo de- voraverint.

66. *Scolopendra terrestr. ducentipeda*. Spithamea est, tenuis, coloris lutei, capite fusco, corniculis geniculatis, & acutâ forcipulâ armato, oculos nec Microscopio ob- servavi. G A Z O P H. N A T. & A R T. Tab. 79. G A Z. N A T.
Tab. 79. Fig. 1.
fig. 1.

67. *Cacaluy Indorum*, est *Julus Æneus*, *Millepeda* seu *Scolopendra Rondeletij*, dum capitur sese in spiram con- volvens : *Juli* cremati pulverem mirifice urinam pro- vocare refert *Merula*. Julorum humor cum cruore ex oniscis expresso, ad albuginem oculorum tollendam, divinum & efficax remedium.

68. *Julis Luzonis alter.* Minor est priore seu æneo, coloris castanei, circulis seu annulis magis gibbosis, ad magis prostantes, & villosos flaventes pedes, lunatis & flavis maculis pictus, nec ita prompte in spiram convolubilis.

69. *Bajur Indorum*, est *Julus maximus innocuus*, seu *Scolopendra terrest. maxima Mouffet.* (Scolopendram vero titulo *Hypocompi* delineat,) in spiram sese convolvens, ut priores, quem cœpi in Sylvis *Silani*, palmo longior erat, pedibus innumerabilibus flavis, gressu undas referentibus, corpore nigro & rubro striatim transversimque variegato. Reperitur & crassitudinis digiti Indicis. Noctu strepitum edit *Gryllo* magis sonorum.

II. *An Account of an Experiment made before the Royal Society at Gresham College, together with a Repetition of the same, touching the Production of a Considerable Light upon a slight Attrition of the Hands on a Glass Globe Exhausted of its Air: With other Remarkable Occurrences. By Mr Fra. Hauksbee, F. R. S.*

HAVING had the Favour of making several Experiments, in Relation to the Production of Light from Sundry Bodies, and in Different Manners, before this Honourable Society, which they were pleas'd to Countenance, by their Approbation and Publication of them, as being in some respect or other, Different from any heretofore made on the same subject: Which, with the Hopes I had still of Advancing some farther Discoveries; And that I thought my Endeavours of this kind would not be altogether unacceptable to the Society, Together with the Nobleness of the Subject concurring, prompted me with all willingness to prosecute the same.

The Experiments already made on this head, As the Attrition of Amber on Woollen, Glass on Glass, and with several other Bodies *in vacuo*, which tho' afforded but a weak Light, yet the Manner of making them seem'd to open a way to farther Improvements, which, during the late Interval of Meeting, I pursu'd with my utmost diligence. The Result of the many Experiments made on this occasion are compriz'd in a very few, which shall be repeated before this Honourable Society, as Opportunity shall give leave.

One of that small number I had the Honour to make before the Society, who were pleas'd to order a Repetition of the same next meeting, which accordingly was done, with some little Additions ; and in obedience to their Commands to give an Account of it, which, so far as occur'd to Memory, according to my slender Capacity for such a task, accept as follows. I took a Glass Globe about 9 inches diameter, and having exhausted the Air from within it, it was taken from the Pump ; but first a Cock was turn'd, which prevented the Air from re-entering it. Thus secur'd, and fixt for to give it Motion by the Great Wheel, describ'd in *Phil. Transf.* Numb. 304. which when turn'd gave a swift motion to the Globe, on whose surface was apply'd my open and naked Hands, which in a very little time produc'd a considerable Light. And still as I mov'd my Hands from one place to another, that the Humid *Effluvia* (which very readily condenses on Glass) might be discharg'd from every part of it ; so did the Light improve, till Words in Capital Letters were legible by it, as was observ'd the last time by a Gentleman then present. At another time, when I have made the Experiment, the Light produc'd has been so great, that a Large Print without much difficulty might be read by it : And at the same time, altho in a pretty large Room, the whole became sensibly Illuminated ; the Wall at the farthest distance (which was at least 10 foot) was visible. The Light appear'd of a curious Purple colour, and was produc'd by a very slight and tender touch of the Hands, the Globe Glass at the same time being hardly sensibly warm. Nor do I find a more immoderate Attrition to advance the Light any thing. Nor is the high st degree of Rarification of the Air in the Globe, absolutely necessary in the production of this Light ; for it seem'd to continue very little less'n'd in its colour or vigour, till (I believe) more than a fourth part of its Air was let in. I have often observ'd the same, as to the Light produc'd

duc'd in the Mercurial Experiments, (but not as to Colour) for in those Experiments it was always pale: And there being such a seeming Congruity of Appearances in all the Circumstances of them, with those made on the Attrition of Glass without it, that one might with some probability conclude, that the Light produc'd proceeds from a Quality in the Glass, upon such a Friction or Motion given it; and not from the Mercury, any other ways than as a proper Body, which falling or rubbing on the Glass, produces the Light. And that which would seem farther to Corroborate such a Conclusion is, That some time ago I took a Mercurial Barometer, and rubb'd the upper or Deserted part of the Tube between my Fingers, and a Light ensu'd, without the motion of the Quicksilver. Yet for all this the Conclusion is doubtful, and there may be such a Quality as Light in Mercury, as well as in Glass or any other body, since an Experiment lately made on purpose seems to contend for it, and is as follows. I took a small quantity of Quicksilver, and put it into a Galley-pot, wherein Varnish often had been used, and by that means it had got a pretty thick Lining of it; the Weather was at that time moist (which I purposefully mention, because the humidity in the Air, would sometimes render the Experiment unsuccessful even in Glass, or at least mightily impair the appearance of it,) which had an influence on the Varnish, as something to soften it. However, the success of the Experiment was, That when the Galley-pot with its contain'd Mercury came to be *in Vacuo*, upon shaking the Pump a Light did appear, and this without the Concurrence of Glass, or the favour of a more proper Season to assist it. Moreover, I am inform'd by several Persons of credit, that the Medicine call'd *Mercurius Dulcis*, when broken in the dark, gives notable Flashes of Light; but the Mercury in the Medicine being pointed with Salts, each little Globule of it is enveloped with the same, that I cannot be assur'd the Salts do not

contribute to the *Phænomenon*, since I have often observ'd that Loaf Sugar, when struck or broke in the dark, affords a Light, and I cannot tell but Salts as closely united in their parts as the prementioned Sugar, may give a Light upon a violent separation of them, till I have made some Tryals, in relation (as near as I can) to a true discovery of it: (Which I design with the first opportunity.) The first will be to try whether the Medicine when broken *in Vacuo* will afford any Light, which I think I may expect if it proceeds from the Mercury, since if there be any such Quality in that body, it seems to be the most proper *Medium* to discover it in. Secondly, what the Salts will do without Quicksilver, both in the open Air and *in Vacuo*; for there are some Bodies that appear light in the dark in the open Air, which altogether lose that shining Quality *in Vacuo*. As for instance, I took a piece of Wood, (which I suppose had lain under ground a considerable time,) it was very moist, but not rotten, and appear'd very vividly of the Colour of Fire in the dark: Having included it under a Receiver on my Pump, I found as the Air was taken from it, so did the Fire-like Appearance of it decay, till at last *in Vacuo* it became perfectly void of Light; and as the Air was let in again, so by degrees it recover'd its pristine Appearance. This I repeated several times with the like success. Now begging pardon for this long digression, I proceed to the latter part of the Experiment. After the Attrition of the exhausted Globe was continu'd for some time, the prementioned Cock was return'd, which gave liberty for the Air to insinuate into the Globe through the joyns of the Screws; the motion of the great Wheel and the application of the Hands continuing all the while: And as the Air fill'd the Globe, so the mode of Light continu'd to alter, till the like quantity of Air had re-enter'd as was taken from it; then became as great a difference of Light from what was produc'd when evacuated of Air,

Air, as when the Experiment was made with Quicksilver-*Vacuo* and in the open Air. Certain Specks of Light were then seen upon the Fingers that toucht the Globe, but without any great Lustre, and it was very remarkable that while my hand continued upon the Glass, and the Glass in motion, if any person approach'd his Fingers towards any part of the Glass in the same Horizontal Plain with my Hand, within an inch or thereabouts, a Light would appear to stick to the Fingers, notwithstanding they did not touch the Glass, as was confirm'd by several then present. And my Neckcloth at the same time, at an inch or 2, distant from it, appear'd of the colour of Fire, without any communication of Light from the Globe. Thus much for the latter part of the first Tryal. The former part of both being alike, save only that upon application of white Sheeps Leather in the latter, a very good Light was produc'd, during it was held to the Globe with the Wool side next it; but when the same piece of Leather was turn'd with its other side to the Globe, no Light did ensue, although continued for some time; but so soon as it was chang'd again, the Light would appear as at first, and so upon several Repetitions the same. As to the latter part of this Tryal, the Air was not let in all at once as before, but at several times, whereby the Modes of Light produc'd in the different *Mediums*, were the better observable, although no very great Alteration happen'd either to its Colour or Vigour, till so considerable a quantity, as more than a quarter part of the Globes natural content of Air was let in; but sometimes before half the Air was suffer'd to re-enter (as near as I could guess) it was not without some pleasure to behold, how the Light began to break in Branches from that side the Globe touch'd by the hands, filling the whole body of it with very odd Figures, and these Branches of Light, at the entrance of more Air, were become in more slender Stems, striking then against the opposite side of the Glass, and thence reverberating again

in a very pleasing manner; but after more and more Air was let in, so the Light and Figures diminish'd, till the Appearance became the same as related in Tryal the first.

III. *A Letter from Mr Samuel Dale to Dr Hans Sloane, R.S. Secr. giving an Account of what Manuscripts were left by Mr John Ray, together with some Anatomical Observations made at Padua by the said Mr Ray.*

HErewith you will receive divers *Anatomical Observations*, that were made at *Padua*, by our late learned and most ingenious Friend the Reverend Mr *John Ray*, upon the dissection of some Humane Bodies, by that great Anatomist *Seignior Antonio Marchetti*, and do contain, besides those things which Mr *Ray* did himself remarks, divers Observations of the Operators which did not occur in those Bodies, to some of which Mr *Ray* hath added Notes. To these are subjoyned two Dissections of Mr *Ray's*, viz. of a *Hare*, and the *Mountain Hen*, neither of which can I find published in his Works, nor hath he taken any notice of these Observations in his *Book of Travels*, altho the Charge was very considerable, amounting to 284 *Livres* and 15 *Soldi* of *Venice*.

Besides these, there are in his *Adversaria* many *Observations*, *Inscriptions*, *Epitaphs*, *Antiquities*. &c. which being collected together, would make a large *Supplement* to his *Observations* already published.

Nor must I forget his *Travels* in our own and the neighbouring Kingdom, of which he hath left divers *Itineraries*: These may not be unuseful to our *English Travellers*,

vellers, he being as careful in making Observations and Collections at home, as he was in foreign Countries.

Had his Life been protracted but another Summer, he would in all liklyhood have finished his *History of Insects*, for which he had been preparing Materials divers years; this Work being far advanced, doth not deserve to be committed to the Moths, but to be carried on by some learned and ingenious Person in that Study.

Thus, Sir, I have briefly answer'd the desire of your self and others, in acquainting you with what Manuscripts Mr *Ray* hath left, which might be useful to the Commonwealth of Learning. I am, &c.

*In Corpore dissecto Patavii a Marchetti observata,
10mo Decembris 1683, S. V.*

EOdem modo quo alii *Anatomici* dissectionem exorsus est, *Abdominis* nimirum cutem in crucis formam secando, umbilico tamen intacto.

Cuticulam à cute separabat candelam accensam sub cute tenendo, quæ cuticulam in vesicam attollebat, unde facile eam scalpello separabat. *Cuticula* à cute nisi vel actuali vel potenciali cauterio, i. e. vesicante separari nequit.

Sub *Cute* copiosa *Pinguedo* semidigitum crassâ abdomen totum investiebat. Erat autem pinguedo crebris fibrillis veluti fulcris ne diffuêrat stipata.

Sub *Pinguedine* panniculus seu *membrana carnosâ*, quæ tamen hac in parte carnosâ non apparebat; erat etiam & sub membrana carnosâ aliqua pinguedo sed parciôr. Membranam hanc ille in Bruti duplicem esse asseruit, quia Bruta cutim totam movere possunt & corrugare, in homine duplex est in fronte, unde & frontem contrahere & corrugare potest, in nonnullis etiam duplex est in Occipite, unde & totum Capillitium commovere possunt. *Verum alii diverjam rationem assignant bonum motuum, nimirum quia in Fronte & Occipite*

mem-

membrana carnosâ cuti arcte cohæret & in Musculum degenerat, quod probabilius est.

Tum *musculos abdominis* aggrediebatur, & primam *Oblique descendentes*, qui à medio circiter costarum notharum exorti ferratim cum musculo Thoracis *ferrato* coaptantur, (ut in futuris Ossium). In parte posteriore musculus dorsi latissimus huic incumbit, atq; idcirco aliquemque primum elevandus est.

Musculi recti eminentijs, seu processibus ossium pubis lato tendine adnectuntur, superius à cartilagine primæ costæ nothæ prope cartilaginem ensiformem utrinq; oriuntur tendinibus nervosis.

Oblique ascendentes, à suprema margine ossis *Ilei* radiosis fibris exortij, venam musculam recipiunt à ramis *iliacis*. Secundò *Oblique ascendentes*, in quibus nihil singulare, ortum habent à summitate ossis *Ilii*: Tendo ejus duplex musculos rectos veluti amplectitur: Una sc. ejus pars musculo recto incumbit, quæ antequàm dimidium latitudinis musculi superavit, cum tendine oblique descendents arctissimè cohæret, vel potius in unum coalescit, ut nulla arte possit separari: Altera sub musculo recto eodem modo cum tendine musculorum transversorum coalescit. Venam accipit à Musculâ dictâ quæ à ramo *Iliaco* oritur.

Musculi recti duas tantum habuere inscriptiones nervosas, cum in alijs 3. alijs 4. aut. 5 habeant, ut observat Vesslingius. In his Musculis observavimus anastomoses venæ *Mammariæ internæ* & venæ *epigastricæ*.

Musculi transversi à processibus vertebrarum lumborum oriuntur; non autem Musculi oblique ascendentes illis vertebris annectuntur ut ille observat.

Musculos etiam *pyramidales* in hoc cadavere observavimus, qui rectis oblique incumbunt.

Ob. 1. Pinguedo in dorso Fœminarum liquidior & mollior est quàm in maribus.

2. Cutis in ijs quæ pepererunt circa *Ilia* corrugatur, in Virginibus non item.

3. Ve-

3. Vena, Arteria & Nervus semper se mutuò comitantur, arteria ad dextram, vena in medio, nervus ad sinistram.

4. Sub musculis supra peritonæum prope lumbos copiosam observavimus pinguedinem, unde in hac parte facile à peritonæo separantur muscoli, verùm prope lineam albam cum tendinibus musculorum arctissimè cohæret ut nulla arte separari possit.

5. Musculos etiam in originibus seu capitibus suis tendines habere asseruit.

6. Incipit dissectare musculos à capitibus seu originibus, quia ita motus seu usus musculi in motibus facilius discernitur.

7. Caveendum est Chirurgis ne musculos transversim ad fibras secent, quia ita periculum est ni nervis (qui semper cum fibris parallelis decurrunt) dissectis, convulsiones oriantur.

8. Si quis velit rectè dissectare & separare musculos, debet accuratè observare fibras, earumq; ductum sequi.

9. Musculi transversi tum in initio, tum in fine latam habent tendinem membranosam.

Ostendit tum nobis *vertebras lumbares*, numero quinque ; singulæ processus 7. obtinent, spinatum unum, transversos duos; obliquè ascendentes duos, & obliquè descendentes duos : Obliquè ascendentes inferioris cum obliquè descendibus superioris per Ginglymon articulantur : Vertebrae verò ipsæ per harmoniam, cavitas scilicet superioris gibbum seu protuberantiam inferioris recipit.

Os Sacrum ex 6 componitur ossibus nonnunquam, communiter 5 ; cum è 6 constet, *Os coccygis tertia tantum* habet ossa, cum è quinque quatuor. *Os coccygis* interiùs curvatur ad commodiorem sessionem.

In difficili partu, *Chirurgus* immittendo digitum in *Intestinum rectum*, & retrahendo seu reflectendo *Os Coccygis* partum facilitare potest : Quod & *Marchettus* se fecisse asserit.

Os Sacrum magna habet foramina ad egressum nervorum.

Afferit ille *Ossa* hæc quæ pelvim constituunt in foeminis ampliora non esse quam in viris pro ratione corporis, ut alii afferunt.

Os Ilium, *Os Pubis*, & *Os Coxæ* seu *Ischion* in adultis in unum velut os coalescunt, in Infantibus distincta sunt, & cartilagine juncta. Omnia hæc tria ossa femoris acetabulo coeunt, & singula partem aliquam cavitatis efformant. In osse ileo distinxit marginem, costam, dorsum, sinus duos, superiorem unum, super quod nervus è summo foramine ossis sacri egressa transiens ad crura descendit, inferiorem aliam inter eminentias duas ad commodiorem sessionem.

Nervi egrediuntur ad latera vertebrarum è foraminibus inter duas vertebrae formati.

Ostendit *Viscera* & *Intestina* in situ, *rectum* scil. *colon* quod omnia intestina circumcinxit; *cæcum* ad dextrum latus digiti parvi magnitudine, quod ille in foetu & Infantibus nec majorem, nec excrementis repletum unquam inveniri ex sua observatione assererat. Supra *cæcum* immediate incipit *Ileum*, quod & majus est & excrementis repletum: deinde *Jejunum*, quod & carnosius, & vasis plenius, & magis rubidum, & excrementis vacuum; *duodenum* ad flexuram terminatur.

Pars illa *Mesenterii* cui *colon* annectitur *Mesocolon* dicitur, reliqua pars, cui tenuia intestina, κατ' ἐξοχὴν *Mesenteriam* appellatur. *Arteria Mesenterica* inferior per totum *colon*, atq; etiam *rectum* ramos spargit, unde *Arteria hæmorrhoidalis*, *mesenterica* superior ad reliqua omnia fere intestina.

Splen in hoc cadavere prægrandis ultra naturalem molem: Hoc illæ ebriositati assignabat.

Colon in hoc cadavere peritonæo adhærebat.

Musculi Pyramidales a processibus seu eminentiis ossis pubis utrinq; orti & oblique ascendentes tendinibus suis vicinis in *linea alba* terminantur : inserviunt hi urinæ expellendæ comprimendo *Vesicam* autore *Fallopio* ; ubi hi desunt (ut in nonnullis fit) extremitates musculorum rectorum latiores sunt.

Ostendit insuper *venam umbilicalem*, quæ in fissuram *hepatis* inseritur, & in *ligamentum* degenerat : *Arterias umbilicales*, quæ peritonæo adnexæ decurrunt ad ramos usq; iliacos arteriæ magnæ : *Urachum*, qui pariter adnexus peritonæo ad fundum vesicæ descendit, eamq; sustentat, quinetiam in homine ligamenti duntaxat usum præstare, nec omnino perforatum esse.

Ostendit præterea *uteri tubos*, *uteri ligamenta rotunda*, *testes muliebres*, & *vasa Spermatica*, nec non *ligamenta lata*.

Hepatis ligamentum latum. Hepar in viventibus & sanis non incumbere ventriculo, ac proinde unguenta, fomenta, & epithemata ventriculi regioni exterius rectè applicari.

Ligamenta uteri rotunda perforant peritonæum & omnes mûsculos, & deinde divisa unum mittunt ramum ad *Clitoridem*, alterum ad genu usq; q.

Venas & arterias gastricas & gastroepiploicas ostendit & descivit accuratè ; verùm in his omnino consentit cum *Veslingio*, quem adi.

Obs. 1. Bubones nonnunquam oriuntur etiam in his quæ castæ sunt, verùm in ijs sine suppuratione possunt discuti : *Veneriei bubones*, nisi gonorrhœa succedat, semper suppurantur.

2. *Valvulam* in coli initio observavimus ; iliacam passionem *Volvulum* dictum oriri ab inflammatione istius valvulæ, quæ impedit ne excrementa descendant, ex propria observatione asseruit ; adeò sc. angustatum vidit foramen ut ne cuspidem aciculæ potuerit admittere.

Venæ ventriculi sunt vel propriæ vel communes : Propriæ sunt 1. *Gastricæ sinistræ minores* 3 aut 4. (quarum

prima & brevissima vas breve dicitur) a ramo Splenico venæ portæ propè lienem ortæ. 2. *Gastrica sinistra major* seu *coronaria*, quia in summitate ventriculi sparsa coronæ in modum. 3. *Gastrica dextra* seu *pylorica*. Communes sunt. 1. *Gastroepiploica sinistra*, quæ a ramo Splenico propè lienem exorta fundum perreptat ventriculi, hinc in ventriculum indè in omentum ramos subinde spargens, in omentum verò unum insignem epiploicam sinistram dictam. 2. *Gastroepiploicam dextram* in hoc cadavere a ramo mesenterico ortam propè pylorum, quæ pariter fundum ventriculi perreptat hinc in ventriculum indè in omentum obiter ramos spargens, maximo suo ramo seu trunco *gastroepiploicæ dextræ* per anastomosisin conjuncta. Est hæc vena insignis & unum præ cæteris memorabilem emittit ramum epiploica vena dextra dictum.

In fundo *vesiculæ felleæ* nulla sunt conspicua vasa quæ *bilem* eo deducant, sed *porositates* quædam quæ *bilem* transmittunt, & proinde cùm separatur vesicula ab hepate humor biliosus manifestè exudat. Quinetiam capillares quædam venulæ ab ipso hepatis parenchymate in membranas vesiculæ sparguntur adeò, ut sine effusione sanguinis ab *Hepate* dividi nequeat. Afferit vesiculam felleam quâ parte hepatis conjungitur simplici tantum membrana constare, alibi duplici.

Meatus cysticus ubi in ductum communem terminatur valvulum non habet, sed *ostiolum* tantum, quod refluxum bilis impediat.

Hepar 3 habet sinus, unum in quo jacet cystis fellea, alterum in quem intrat vena umbilicalis, tertium ubi transit venæ cavæ truncus.

Cystis fellea arteriam habuit grandissimam, venas parvas. Observasse se dixit ubi arteria magna est, ibi venam esse parvam quæ ei respondet, & vice versa: Non credo.

1. Afferit præterea, ubi meatus cysticus obstruitur, ^{Opiniones} icterum flavum oriri, ubi porus cholidochus, icterum ^{Machetti vi-} nigrum. ^{probabilis;}

2. Vasa venæ portæ & cavæ in hepate non conjunguntur per oscula, sed per harmoniam aut incumbentiam mutuam vasorum.

3. Vena portæ intra hepatis parenchyma non induit membranam novam.

4. Se vidisse venas lacteas in ipsum venæ portæ truncum insertas.

5. Se nunquam potuisse invenire neq; credere dari ullum commune receptaculum chyli: *Experientia mea contrarium evincit.*

6. Se vidisse ramum insignem ductus chyliferi in pancreas desinentem.

7. Se putare usum lienis esse, separare bilem atram a sanguine, eamq; una cum sanguine ad hepar transmittere per ramum Splenicum, ubi per meatum cholidochum expurgatur in intestina.

8. Se putare venas lacteas chylum exugere ex intestinis, eumq; ad pancreas differre, cujus usus est eum ulterius perficere & exaltare, partemq; excrementitiam in intestina per novum vas *Virsungianum* ablegare.

9. Se vidisse venas lacteas in mesocolo ad intestina sparsas; quod proculdubio verum est. *Vera nobis visa.*

10. Venas hæmorrhoidales externas a vena cava non oriri, sed ramos esse venæ portæ: Ejus autem furculos extremos cutim etiam ipsam perforare, & in tubercula sub cuticulâ desinere; & his applicantur Hirudines. Oritur Hæmorrhoidalis vena aliquando à ramo splenico, aliquando à mesenterica, sæpissime in ipsa divaricatione venæ portæ. Vena hæc ramos suos spargit per totum mesocolon.

Mesocolon a mesenterio tenuitate sua differt.

Arteriæ satis amplæ a cœliaco ortæ tres aut quatuor rami lienem ingrediuntur.

Vena Splenica plures rami per totum lienis parenchyma sparguntur contra *Sylvium*, qui asserit eas osculis suis duntaxat in lienem hiare, substantiam verò ejus non penetrare.

Obs. Cum quis ex morbo diuturniore moritur, lien nigricat; si violenter moritur, rubicundior est.

Novum vas pancreatis & *porus cholidochus* eodem in loco duodenum perforant; aliquando diversis foraminibus in intestinum exeunt, ut in canibus fit.

Ostendit nobis in *mésenterio* nervorum plexum; cui *usui* qui?

Porus cholidochus in hoc cadavere mihi videbatur esse amplissimus.

Ren sinister in hoc & alijs omnibus major est dextro & superius situs, & à trunco venæ cavæ remotius, undè & emulgens longior est. *Huic rei rationem sane probabilem dedit, quia* hepar in dextro latere ei incumbens tum illum deprimit, tum augmentum ejus prohibet.

In dextro latere duas habet hoc cadaver *arterias emulgentes*, unam consueto loco in sinum renum ingredientem, aliam in superiore extremitate.

Ureteres in hac foemina amplissimi, quod ille omnibus foeminis commune esse asserit, quia humidiores sunt, & plus mingunt.

Glandula renalis dextra ab ipso venæ cavæ trunco venam accipit; sinistra verò ab emulgente. *Glandulae* interiorius cavitatem habent. Dextra ipsi reni incubuit.

Arteria spermatica utraque ab ipso aortæ trunco infra emulgentes sibi mutuo proximè oriuntur. Venarum altera ab emulgente, altera nimirum dextra duplici trunco, uno ab emulgente, altero trunco venæ cavæ, qui paulo post in unum conveniunt, exoritur.

Affirmavit se vidisse venas lacteas in prægnantibus ad uterum sparsas; quas probabili conjecturâ aquosum illum Serum in quo infans natat ad uterum differri putat. *Venas hæc lacteas in Ove præguante facillimus inveni.*

Mesenterium a tribus superioribus lumborum vasis oritur.

Monstravit *vasa seminalia*, quæ ad *testes* quidem deiciunt, eos verò non intrant, sed supra ligamenta lata ad convexum testiculi latus decurrentes, partim in *tubos uteri* sparguntur, partim in *uterum* ipsum.

Tubi uteri ad utrumq; fundi angulum siti cornibus uteri in animalibus respondent, & sunt omnino cavi, adeò ut ab utero ad extremitates eorum usq; possit stylus immitti: Tunica eorum interior albicat, inq; ijs sæpius reperitur humor serosus albidus, qui *semen muliebre* esse creditur.

Testiculi muliebres epididymidibus carent; una extremitate nervosis ligamentis utero annectuntur; substantiam habent molliorem laxiorémque testiculis masculorum. Unus horum exulceratus cavitatem habuit.

Quòd *testes* tam in maribus quam in foeminis ad generationem nihil conducant memorabili imprimis experimento probavit. Canis nimirum masculi testes execut epididymidibus integris relictis, deindè canem foeminam in cubiculo conclusit per tres annos, nec ullum admisit ad eam canem cum salaxasset præter castratum hunc, qui canem iniit & cum eà sæpius implicatus est. Triennio hæc ter peperit, una vice 7 catulos, altera 9, tertia 5. Re satis exploratà foeminam dimisit. Alias duas vel tres historias huic parallelas nobis narravit; unam de Equo castrato relictà tamen epididymide una, qui equas sæpius imprægnavit, fuitq; in venerem admodum proclivis: Alteram de cane quem ipsius servus execut: Tertiam de homine quodam rustico, qui ob bubones venereos utrumq; testem amisit & epididymide unica duntaxat manente, qui tamen uxorem duxit, & tres masculos filios genuit. Credit ergo ille testes non alijs usui servire quam quem *Aristoteles* adfert, nimirum ut sint pondera impediencia ne *Spermatica vasa* implerentur; & revera vasa seminalia in eos non terminantur, nec transeunt, sed epididymides solam.

Uteri cavitas perangusta est & minima, verùm tunica uteri spissior densiorq; quàm ego credidissem.

Ligamenta uteri rotunda non sunt in uterum perforata, verùm vas deferentibus in masculis quoquomodo respondent.

Orificium internum uteri in gravidis lentâ & viscosâ materiâ observatur, *ut nos sæpius in bove observavimus*, adeò ut nihil omninò in uterum penetrare possit: Unde nihil feminis in uterum projici possit, adeoque nec superfœtatio fieri. Narravit tamen nobis se audivisse de muliere quadam rustica in montibus vicinis degente, qui tribus mensibus postquam unam peperisset prolem aliam denuò peperit.

Os ipsum uteri *Tinæ piscis* ori persimile, corpus uteri cucubitæ tonsoris.

Vagina uteri ampla est atq; intus rugosa, in meretricibus vero longo veneris & assiduo usu rugæ istæ abolentur, & omnino levis evadit.

B.N. Ad hanc uteri vaginam vasa quamplurima (venæ sc. & arteriæ) tendunt, a ramis iliacis interius sive hypogastricis orta, miris plexibus & anastomosis juncta, quæ in superficiem vaginæ sparguntur, & probabile est oscillis suis sive capillaribus extremitatibus in cavitatem ipsius hiant, in eamq; effundunt *Sanguinem menstruum*, quanquam se nunquam horum vasorum orificia potuisse invenire asserit *Marchettus*; nec mirum. Nonnulli ex his ramis in cervicem etiam uteri sparguntur.

In *pudendo* demonstravit nobis *Labia*, *Clitoridem* in supremo rimæ angulo, *Alas* seu *Nymphas* in superiore etiam parte, *Urethram* seu *meatum urinarium*, & *circulum membranaceum* qui pudendum à vagina uteri distinguit, quiq; in virginibus membrana *hymene* dicto occupatur totus, excepto foramine in medio per quem menstrua defluunt.

In defloratis etiam apparet hic circulus qui pudendum hoc loco coarctat, ponè quem vagina laxior & amplior est.

Vagina

Vagina hæc ultra interiùs uteri orificium inferius percurrit, unde si membrum virile longius quàm par est fuerit, ultra orificium interius uteri in hunc sinum sperma projicit, unde uxorem imprægnare nequit.

Ait se observasse etiam in fæminis utero gerentibus uterum fuisse duos ferè transversos digitos crassum.

Obs. 1. Ratio cur virgines coitu liberantur à morbo illo nostratibus (*The Green Sickness*) est quia membrum virile distendit nonnihil vaginam uteri, & fluxione sua refert orificia venarum, adeòq; menses affluere facit.

2. Locus ubi fœminæ calculo laborantes à *Chirurgo* debent secari est in superiore vulvæ parte prope labia, *Stylum* in *urethram* immittendo, & super eam secando in carnosio vesicæ collo.

3. *Urachus* in homine (né in fœtu quidem dum adhuc in utero matris latitat) perforatus non est ex observatione *Marchetti*, sed usum tantùm ligamenti ad sustentandam vesicam præstat.

4. Se nunquam in medio ureteris hærentem invenisse calculum, sed semper vel prope infundibulum, vel prope vesicam.

16to Decembris.

Ostendit *Musculos pectoris*, & primò *pectorales* dictos, qui inserviunt adducendo brachio ad pectus, horum & insertionem q. in *Vesling.* deinde *Musculos serratos anticos minores*, qui inserviunt humero antrorsum adducendo, & sub pectoralibus sici sunt in processu *coracoides* inferi.

Tum *musculos serratos anticos majores*, qui inserviunt scapulæ antrorsum deorsumque ducendæ; in basin *aperturæ* inseruntur.

Post *intercostales externos*, qui ab inferiore latere costæ superioris orti in superiorem marginem costæ inferioris inseruntur; & tandem *intercostales internos* qua à superiore margine costæ inferioris orti in inferiorem marginem costæ

superioris terminantur. Horum musculorum fibræ se invicem obliquè interfecant in crucis *Andreane* formam : Neutorum scil. Fibræ ad costas perpendiculares sunt sed obliquæ.

Notavimus *venas & arterias mammarias* ; *externas*, quæ ab axiliariis oriuntur ; & *internas*, quæ à Subclavijs ortæ, & intra cavitatem Thoracis aliquousq; progressæ in duos dividuntur ramos, unus musculos Thoracis perforat & in *mamas* distribuitur, alter deorsum tendens usq; ad medium recti musculi ibidem cum vena epigastrica extremitatibus suis per anastomosin conjungitur.

Dixit se observasse singulos venæ hujus capillares ramulos in singulos mammarum tubulos desinere, & proinde se putare lac non à chylo sed a sanguine generari.

Musculi subclavij a claviculis, ubi acromio junguntur, orti in costam primam, ubi cartilagini sui committuntur desinunt.

Observavimus *Sphincterem & levatores ani* dictos musculos, qui ab infimo ossis sacri, ubi coccygi committitur, oriuntur omnes.

In *ulceribus ani & fistulis* cavendum est *Chirurgis*, nè fibras Sphincteris transversim secant, quoniam ita amittitur facultas retinendi excrementa.

Vena cephalica dissepit & distinguit musculos pectorales & deltoides.

In collo primùm observavimus *platysma myodes* carnosum, scil. panniculus hoc in loco in musculum degenerat, qui mento affixus caput deorsum trahit.

Deinde *Musculos Mastoideos* dictos : Tum musculos *digastricos*, qui medio suo tendine *Styloceratohyoides* musculos perforant.

Ostendit musculos *ossis hyoidis*, quorum sex sunt paria :

1. *Sternohyoides.* 2. *Coracohyoides.* 3. *Styloceratohyoides.*
4. *Thyreohyoides,* 5 & 6 *Geniohyoides* internum & externum.

Præparavit insuper *columnellam* cum musculis ei famulantibus, quorum duo sunt paria, nimirum *pterygostylinum* internum & externum.

Ostendit

Ostendit musculos *Cartilaginis Scutiformis*, quorum 3. sunt paria. 1. *Sternothyreoides*. 2. *Cricothyreoides*. 3. *Hyothyreoides*.

Musculos *Cartilaginis arytenoidis*, quorum 4. sunt paria: 1. *Thyre arytenoides*, 2. *Arytenoides* seu *Sphincter*, 3. *Cric arytenoides* laterale, 4. *Cric arytenoides* posticum.

Musculos *pharyngis*, quorum 3. paria: 1. *Stylopharyngeus*, 2. *Sphenopharyngeus*, 3. *Cephalopharyngeus*, qui potius carnosum *oesophagi* intium sunt, quam musculi; etiam Musculus *oesophagus* dictus qui gulam constringit.

1. In *Angina Spuria* inflammantur tonsillæ, in *legitima*. Musculi *Laryngis*, sed præcipuè *Arytenoides*.

2. In *Angina Legitima* ipsius *Parents* fecit incisionem in *laryngem* inter duos *annulos* superiores, fistulâ argenteâ in vulnus immisâ, per quam patiens inspirabat expirabatque, adeoque eam curavit. Oportet autem ut Chirurgus incisione facta dividat paulum & diducat curiosè Musculos *Sternohyoides* & *Sternothyreoides*.

3. Dixit se observasse ramulum *ductus Thoracici* sive *chyliiferi* ad pericardium tendentem, per quem immisso tubulo inflavit pericardium, unde non absque ratione conjectabatur lympham in pericardium derivatam esse.

4. Pulmo humanus unguis bovinæ specie externa similis.

5. *Asperæ arteriæ* rami seu *bronchiæ* intra pulmones cartilaginibus angularibus carent.

6. *Valvulæ venæ cavæ tricuspides* dictæ sunt, *arteriæ venosæ mitrales*, quia ambæ junctim acceptæ mitram episcopalem quoque modo representant; *valvulæ venæ arteriosæ sigmoides* dictæ sunt, *aortæ semilunares*.

Pericardium in hoc cadavere præter naturam diaphragmati in sua cuspide erat adnexum.

Observavimus *glandulam geminam* infra *laryngem* sub musculis *Sternothyreoides* ad utrumque *asperæ arteriæ* latus, quæ in *Bronchocele* (cui obnoxij sunt *Alpium* &

mentium altissimorum vincula) mirum in modum intumescunt.

Observavit insuper ductum Thoracicum unum ramulum mittere ad glandulam parotidem.

1800 Decembris.

Præparavit Musculos dorſi, nimirum 1. Musculos *trapezios* seu cuculares dictos à figurâ, de quibus abunde *Vesling*. 2. Musculos *rhomboides*, in basin Scapulæ desinunt. 3. *Levatores Scapulæ*, *patientiarum* & pauperum musculi dicti, quia pauperes cum elemosyna eis negatur Scapulas levant dicentes, *Oportet patientes esse*. 4. Musc. *latissimum dorſi*, in summitatem cubiti inferitur, & ab officio *Aniſcalptor* dicitur. 5. *Serratos posticos minores*, qui superiores. 6. *Serratos posticos majores*, qui inferiores. 7. Musc. *longissimum dorſi*, qui discurrit per totum dorſi longitudinem, initio musculis sacrolumbis unitus, singulis costis duas anſulas seu tendines nervosos largitur, qui se mutuò decussant in crucis formam, anſulæ ſci. exteriores sursum tendunt, interiores deorsum. 8. Musc. *Sacrolumbos* qui præcedentibus initio juncti interiùs, & processibus vertebrarum spinatis ad collum usq; protendantur, singulis costis anſulas pariter donando, verùm exteriores hujus anſulæ carnosæ sunt, & non tendinosæ, quemadmodum præcedentis. 9. Musc. *Semispinatos*.

Præparavit insuper Musculos capitis & colli; & primò *Splenios* dictos, quia Splenem bubulum repræsentant, in occiput inferuntur, atq; etiam (quod non habetur apud *Vesling* alioſve) tendinem satis validum à reliquâ ſui parte diviſum ad proceſſum tranſverſalem 2dæ cervicis vertebræ mittunt. 2. *Complexos*, adeo dictos quòd quaſi à diverſis musculis compositi videntur. 3. *Rectos majores* ſive externos. 4. *Rectos minores* ſive internos, a primæ vertebræ tuberculo exortos. 5. *Obliquos superiores*. 6. *Obliquos inferiores*. 7. Musculos *maſtoideos*. 8. *Longos*. 9. *Scalenos*. 10. *Tranſverſales*.

les. 11. *Spinatos*, de quibus consulantur auctores. Tandem præparavit Musculos *Sacros* & Musculos *quadratos*.

Monstravit musculos faciei. In fronte membrana carnosâ in musculus degenerat, ibi incipiens duplicari ubi desinunt capilli.

Obs. 1. Musculi labia obliquè moventes seu dividentes, *Sardonii* dicti, in morbo illo risu *Sardeo* nimirum debent secari.

2. Si caput inungatur pinguedine supra Cranium humanum nascente capillos abunde producit.

3. Qui é Febri maligna moriuntur, iis intestina post mortem livida aut viridi-cœrulea apparent.

4. Non est pericranium à periosteo diversum, verùm periosteum in capite dicitur pericranium, potestq; in plures v. g. 7. vel etiam 10. plagulas dividi.

5. Musculi temporales ob tutelam & ut in situ contineantur membranâ propriâ conteguntur, quam nonnulli falsò pro pericranio habuerunt. Cavendum est ne hæc membrana lædatur : Siquidem vulnus ei inflitum, non rarò convulsiones excitat, unde & hujusmodi vulnera lethalia habentur.

1970 Decembris.

Præparavit musculos faciei : Nasi duos, triangulares sci. & obliquos : Oculi, sphincterem palpebrarum : Labiorum, elavatores sci. labii superioris, quorum duo paria; unum ab angulo interiore oculi ortum labiis & naribus commune. Musculi ab osse jugali nati, ideoque *Zygomatici* dicti, in risu *Sardeo* disseccandi sunt. Observavit in nonnullis hos Musculos deesse. *Constrictor* sive *Sphincter* labiorum Musculus nonnullis *Basitatorius* dictus. Depressores Labii inferioris ab imo mento exorti, admodum spongiosi ubi pili crescunt. Aliud par, quod Labium inferius & superius simul deorsum abducit, in angulos musculi Sphincteris sive Oris insertum.

Musculos

Musculos maxillæ inferioris, scil. *Temporalem*, *Massetarium*, *pterygoideum* internum & *pterygoideum* externum, qui maxillam sursum trahunt omnes; *digastricos* deinde, qui deprimunt.

Not. 1. In cranio perforando trepano, cavendum est a futuris; nam si *Dura Mater* (quæ per suturas cum pericranio committitur) lædatur, periculum ingens est nè ægrotus convulsus moritur.

2. Cerebrum humanum ingens est, corporis magnitudinis respectu habito.

3. In Cerebri ventriculis observavi duo corpora *Hippocampi* & *Bombyces Arantio* dicta ob similitudinem.

4. Cerebrum non pulsat per se, sed Arteriarum respectu: Nam si animalis vivi cranium aperias Cerebrumq; denudes, & ex una parte *Menyngem piam* amoveas cum vasis eidem intertextis, videbis alteram partem pulsare, alteram verò nudam membranâ non item. Asserit seipsum hoc expertum esse, cerebrumq; post amotionem Cranii plùs horæ quadrante pulsasse.

5. Observavimus nervorum par 4. seu *Fallopianum*, qui a posteriore Cerebri parte exorti, ad latera basis Cerebri reptantes, juxta tertium par exeunt.

6. Observavimus plures nervos è 7. conjugationibus non simplices esse, quamvis ex uno foramine exeunt, sed revera divisos & multiplices, nimirum tertium & quintum par ex 4. utrumq; nervis constat, sextum ex 8. vel 10. verum omnes illi simul sumpti non adeo amplii sunt ac ego putaveram.

7. *Glandula pituitaria* major est in homine & solidior, quam ego in animalibus observare solitus sum.

8. Sub infundibuli membranâ duo nobis ostendit corpuscula alba vicæ magnitudine, testiculi figurâ, quæ fratrem suum primùm invenisse dixit, *verum habentur picta apud Veslingium.*

9. In foraminibus Narium maximis observavi 4. corpora, aut etiam plura, oblonga, spongiosa, membranâ tectâ, quæ (ut probabile est) Mucum ne defluat impediunt.

10. *Pia Mater* composita videtur ex tunicis venarum & arteriarum, quæ eam crebræ perreptant.

Post aggressus est Oculi dissectionem, in quo Musculos 6. notavit. 1. *Elevatorum*, *Superbum* & *Hispanum* dictum. 2. *Depressores*, *humiles* & *Capucinos*. 3. *Adducentes*, *bibitorios* & *Germanos*. 4. *Abducentes*, *meretricios*. 5. *Obliquantes*, & 6. *Trochleatores*, *amatorios* dictos.

Anterior tantum tunica humoris crystallini *aranea* dicitur, posterior pro parte *hyaloidis* habetur.

Observavit Musculos in singulos ingredientes nervos; de Musculis Oculi loquor.

Vesiculæ seminales ad vasa deferentia, immediate supra *glandulas prostratas*, veluti alæ utrinq; adjacent, originem seu radicem suam juxta *glandulas* habentes.

Capsulæ Seminales nihil aliud sunt quam vasa deferentia dilatata immediatè supra *glandulas prostratas*.

Meretrices in coitu habent artem *Vulvas* coarctandi, os *coccygis* protrudendo introrsum, adeoq; coitum jucundiores reddendi.

21mo Decembris.

Observavimus in uno cadavere Arteriam Spermaticam inferius a trunco Arteriæ magnæ ortam ascendere & emulgentem supergredi.

Vidimus manifestè *Capsulam Spermaticam* perforatam in *Urethram*, atq; etiam in *vesiculas seminales*, adeò ut in utramque faciliè stylum admittat. Foramen illud, quod in *urethram* exit per tuberculum in ipso *vesicæ collo*, seu *caruculam* in *urethræ initio*, valvulam habet quæ impedit nè *Sperma* involuntariè exeat, aut in *capsulas* regrediatur.

Asteric

Afferit ille se nunquam invenisse semen in glandulis prostaticis, neq; agnoscere ulla foramina per quæ Semen in urethram exeat. *Ego aliter sentio, & puto Sperma in hisce glandulis contineri etiam in homine.* Putat ille glandulas ideo tantum factas esse, ut vesicæ collum comprimant, adeoque conducant ad Semen cum impetu ejaculandum.

In Urethra summa, in glande sci. penis propè extremitatem, canalis se dilatat & foveolam efficit, in qua si materia aliqua acrior aut putrida stagnet, sive Sperma sit, sive urina, acerrimos dolores creat, & pustulas causat.

Gonorrhæa flava vehementissimos excitat dolores.

Musculos manûs disseccuit. Ii autem sunt. 1. *Deltoïdes.* 2. *Coracoïdes*, qui humero attollendo inserviunt. 3. *Rotundus major.* 4. *Rotundus minor*, qui humerum deprimit. 5. *Spinatus inferior.* 6. *Spinatus superior.* 7. *Infrascapularis* sive *demersus*; qui humerum circumrotare creduntur. 8. *Biceps*, præcipuè notabilis ob duplex initium, quorum alterum in sinu vel foveolâ ossis humeri capiti insculptâ, velut nervus arcûs in fibula, tendine suo immittitur. 9. *Brachialis*; qui cubitum flectunt. 10. *Musculus longus.* 11. *Brevis*; qui simul juncûi. 12. *Anconeus*; simul cubitum extendunt. 13. *Quadratus.* 14. *Teres*; qui pronatores dicuntur. 15. *Supinator longus.* 16. *Supinator brevior.* 17. *Musculus palmaris*, qui per totam manûs volam expanditur. 18. *Flexor Carpi externus.* 19. *Flexor Carpi internus.* 20. *Extensor Carpi externus.* 21. *Extensor Carpi internus.* 22. *Flexores primi internodii, Lumbricales* dicti, a tendinibus flexorum 2di internodii orti & carnosi. 23. *Flexores secundi internodii, Perforati* dicti, 24. *Flexores tertii internodii, Perforantes* nominati. 25. *Abductor minimi digiti.* 26. *Annularis.* 27. *Medii.* 28. *Indicis* indicator dictus præcipuè notabilis. 29. *Abductor Indicis.* 30. *Medii.* 31. *Annularis,* 32. *Auricularis*, musculi in formam crucis intra digitos collocati, atq; *Interossei* dicti. 33. *Flexor primi internodii pol-*
licis

licis, 34. *Flexor* 2di internodii, qui in 4 partes dividi
test. 35. *Adductor*, 36. *Abductor* pollicis. 37. *Flexor*
3tii internodii. 38. *Extensor* primus pollicis. 39 *Exten-*
sor 2dus. 40. *Extensores* digitorum, qui articulos singu-
los velut investiant.

2510 Decembris.

We saw the operation of cutting a Child out of the Womb, performed in a Carcass by *Marchetti* the younger: This is called *Partus Cesareus*.

He told us that himself had taken a Child out of the Mothers Womb, after she was dead, which lived 2 or 3 days.

Incisio facienda est in uno latere; cavendum à linea alba & locis ei vicinis, propter musculorum tendines, qui illi omnes conveniunt, & si secentur difficilius coalescunt: In illo etiam latere, seu ibi, ubi infantis caput existere, seu jacere deprehenditur.

In incisione facienda magnam adhibere oportet cautionem, sensim & leniter secando, ne intestina vulnerentur: Postquam Chirurgus Musculos omnes & peritonæum perforaverit, de reliquo debet immittere duos digitos, adeoque omnes musculos & peritonæum attollere, atque digitos sursum versus scalpellum dirigendo secare. Ita cum aperit uterum summo opere cavendum est pariter ne foetum vulnerat.

Postquam foetus eductus est, vulnus consuendum est acn per omnes musculos & membranas aducto; & fila connectenda sunt in singulis puncturis. Uterus ipse nullo modo consuendus est.

Hoc facto in uterum injici debet Decoctum Saniculæ, Consolidæ, & aliorum vulnerariorum; item Vinum maximè austerum. Vulnere autem externo abdominis primò applicari debent lintea albumine ovorum madefacta, deinde Emplastra, ut Diapylma &c. quòd si vulnus ad suppurationem veniat immittenda est in inferiore m partem turunda.

Dixit se nunquam potuisse observare ossa pubis in partu separari, nam & ipse in partu difficillimo ei parti manum imposuit, nec potuit sentire ullam disjunctionem aut oblongationem. Habet etiam argumentum ex Hippocrate contra hanc sententiam desumptum à callo, Qui inter ossa fracta aut luxata existere solet, & in futurum horum ossium separationem impediat.

10 Januarij.

In a Hare dissected we observed the *Intestinum rectum* of a very great length, having large *pilulae* of Dung *secundum intervalla*. I call here the Gut (so far as it had no *cellulae*) *rectum*, though indeed it had one or two convolutions.

The *intestinum caecum* was of a vast bigness and length : In bigness it far exceeded the *Colon*, and was full of Excrement. Just at the entrance into it out of the *Ileum* was another *appendix* of a globular figure ; the *tunica* of it more fleshy, and fuller of Veins and Arteries than the adjoining *caecum* ; there was also a little round hole in it. The *caecum* towards the farther end of it was small, round, fleshy, full of Vessels, red coloured like the *jejunum* in a Man ; the inner *tunica* granulated, and this for more than 4 inches in length.

The *Spleen* was small and long, thicker at one end, it had no *Vesicula fellea* that I could find ; (*In another we found the Vesicula fellea manifestly* :) The *Kidnies* large, and the Left situate higher than the Right. The *glandulae renales* received not their Vessels from the *Emulgents*, but from great Veins on each side going to the Loins.

The *Stomach* was full of Grass (as I conjectured) which smelt like the Wax of an Honey-comb when the Honey is newly drained from it.

It was a Female, and had long *cornua uteri*, but did not *gestate* when we cut it up.

It seemed to have such a cavity under the Tail, above the *foramen ani*, as I have observed in a *Badger*.

I believe now that the Matter contained in the *Stomach* was *Fir* chewed small, the which the smell argued.

2do *Januarij*.

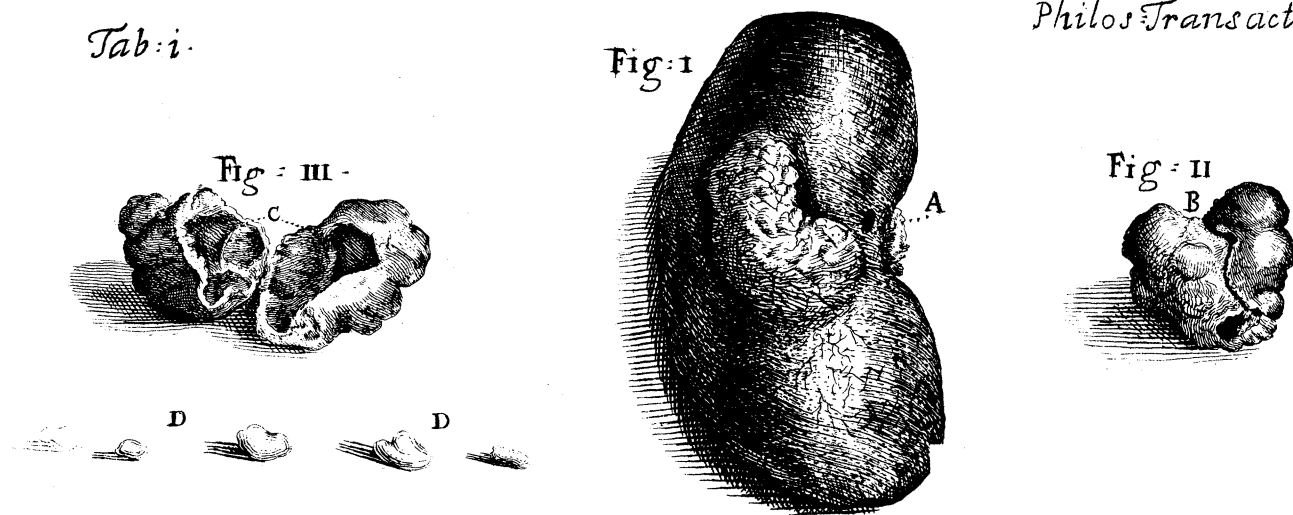
In Gallina montana observavi appendices duas prelongas, dimidium ulnæ excessisse credo : Ad principium suum ubi a recto oriuntur post 3 aut 4 uncias reflectuntur seu convolvuntur, at in prima hac convolutione nulla intus excrementa continent ; tum sursum juxta intestinum utringq; ascendunt, & sunt amplissimæ atq; excrementis plenæ : Ad ingressum suum ubi intestino recto coherent habent velut annularem Musculum seu Sphincterem.

Hepar satis grande, in duos præcipuè lobos divisum. Vesciculam felleam nullam inveni, verum poros biliosos duos magnos diversis osculis non procul tamen dissitis sese in intestinum duodenum aperientes.

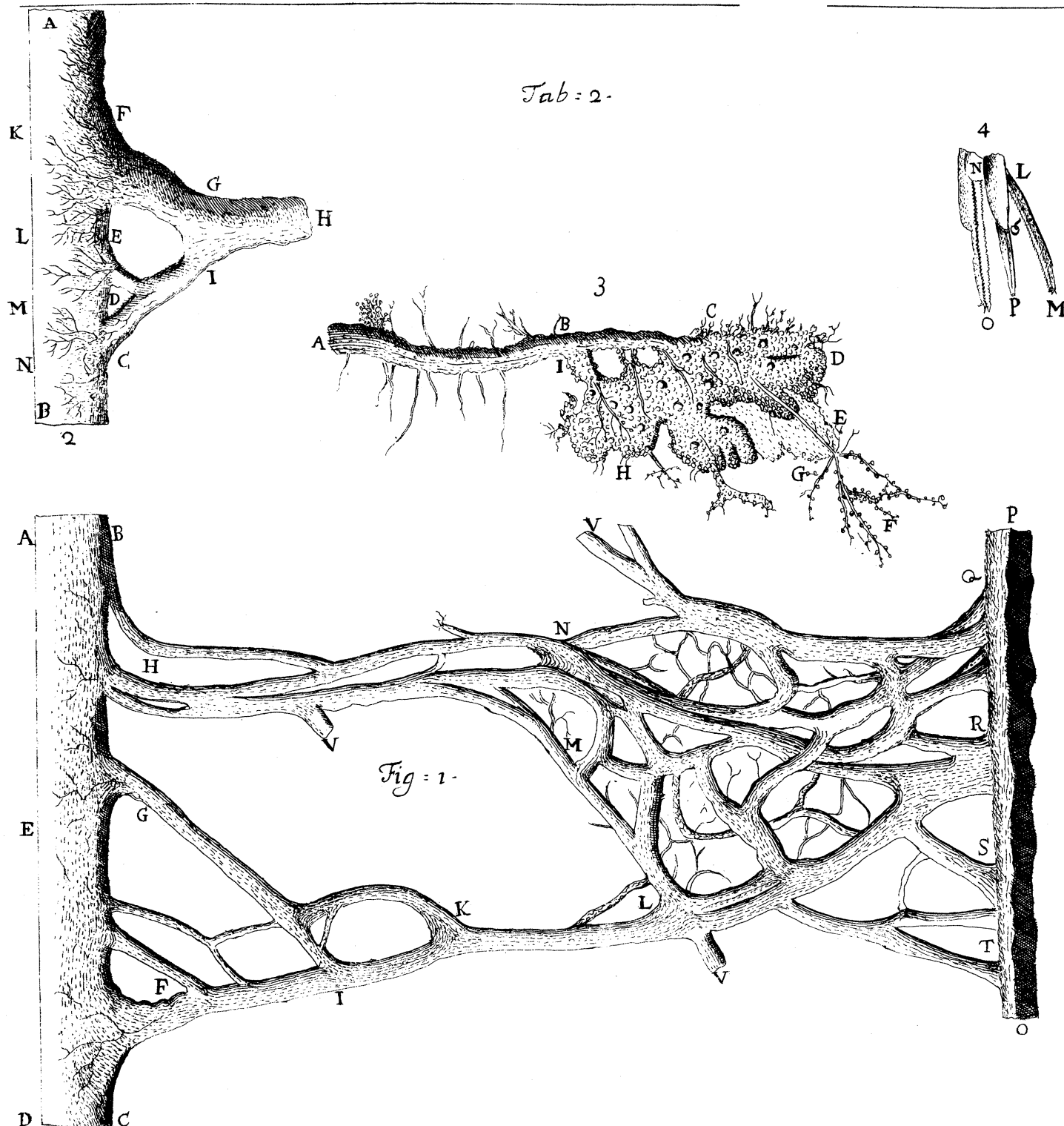
Lien exiguus triangularis. Ventriculus mediocris, musculosus, cujus anterior tunica in duritiem fere corneam concreverat aliqua sui parte : Cor amplissimum.

In ventriculo & ingluvie summitates & germina Abietis frondinum, quæ aperte resinaceum & non ingratum expirabant odorem, materiæ in Leporino ventriculo contentæ simillimum.

Tab: i.



Tab: 2.



IV. Of Hydatides inclosed with a Stony Cruft in the Kidny of a Sheep. By Mr W. Cowper, F. R. S.

IN the *Sheeps Kidny*, which was ordered at a late Meeting of the Society, to be set aside for me to examine, I found a large whitish body, inclining to yellow, and ting'd with red, as it lay under the Membrane of the *Kidney*, *vid.* Tab. I. Fig. 1. A. This was very hard, as is usual in Animal Petrifications, 2 thirds of it lay hid within the substance of the *Kidney*: It was inclosed with a thick hard Membrane, that could not easily be separated from it, even with a Needle fixt in the end of a Stick. The Branches of the Emulgent Veins and Arteries, lay between it and the *Pelvis* of the *Kidney*; all which *Vessels* were somewhat prest by this petrified Body. As I was picking off its thick strong Membranous Inclosures, I found the Needle slip into a cavity at an *Aperture* Fig. II. By this I was inform'd (of what I must confess, before I had no suspicion of) that this hard and heavy *Petrified Body* was hollow, whereupon I thought of dividing it with a *Saw*, but finding a Membranous Interstice in it, Fig 2. B. I pull'd it asunder, as exprest Fig. III. and found its inside divided by many *Petrified Cells* C. of irregular Figures, and fill'd with *Hydatides*, some of which are represented at D.

This uncommon appearance (at least to me) of a *Petrified Cruft* inclosing *Hydatides*, I thought deserv'd the Figure annext.

Tab. I. Fig. I.

The external Surface of the *Kidney* of a *Sheep*.

A. The *Petrified Body* as it appear'd in it before dissection.
Fig.

Fig. II.

The inferior Surface of the same Petrified Body, after the Membrane that inclosed it was taken off.

a The Hole by which it was discover'd to be hollow.

B. The *Fissure* by which it was divided, to shew its inside exprest.

Fig. III.

C. Its *Petrified Cells* that contained the *Hydatides* of various Sizes and Figures, exprest at D when taken out.

V. *Microscopical Observations on the Structure of the Spleen, and the Proboscis of Fleas.* By Mr Anthony Van Leeuwenhoek, F. R. S.

Delft, June 1. 1706.

Amongst other things it has been observed, that the Spleen is compos'd of a spongy sort of Flesh:

And having examined the Spleens of several Sheep, I found that the many Fibrous parts, of which it generally consists, and which many suppose to be Arteries and Veins, are in reality no Veins, but are united to, and draw their Nourishment from the Membranes in which they are radicated, and spread themselves into many Branches, and join with the Fibrous parts, which likewise appear with Roots and Branches growing out of the opposite Membrane, that I could not forbear viewing them with astonishment; imagining that all the innumerable Fibrous parts were constituted to no other end, than to protrude the Blood which is conveyed into them by the Arteries; which Blood in great quantities is contain'd in the Veins, as may appear in great measure in those Veins

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Veins which resemble Arteries; for the Spleen can have no Blood conveyed into it, but what is brought to it from the Heart by the Arteries.

Now this Blood which is carryed through the Arteries that are joyned to the Veins, and make the same Sanguinary Vessels, being transported into the great and large Veins of the Spleen, cannot, in my opinion, be carryed back again into the Heart with such a force, because the Blood that issues out of the Spleen, is not carryed first to the Heart, but immediately to the Liver.

This being granted, I conceive that there is a necessity of a 2d motion, to protrude the Blood out of the Spleen into the Liver, consisting herein, that as the Spleen in Sheep is in great measure joyned by a Membrane to the Diaphragm and partly to the Stomach, as often as the Breath is drawn in, the Diaphragm is extended, whereby the Spleen is compressed, and the Blood thereby so forced into the great Vessels, that it carries part of it to the Liver, and when the Breath exhales, then those Fibrous parts are freed from that Pressure which they underwent by the the drawing in thereof, and so by the extension of the said Fibrous parts, they more easily imbibe the Blood out of the Arteries.

Now if the Spleen had not such a continual motion, the Blood contain'd in it would be very little agitated, because (as I suppose) that the Blood in the Veins of the Spleen, is at least twenty times more than that which is contained in the Arteries.

Which motion sufficiently prevents the Blood from stagnating in the Veins, though the course of it be somewhat slow, for the Globules of the Blood, as far as I can discover, do always coagulate in order to effect a Stagnation of the Blood.

They also say, that the Spleen does purify the Blood, that it may cause no obstruction in the Liver, but those Opinions seem strange to me, and I would ask the People

ple that are of that opinion, where that foul Blood can remain, since there are no other Passages in the Spleen but two, *viz.* one Artery to bring the Blood into the Spleen, and one Vein to carry it out.

Moreover, I inserted a Glass Tube into the great Vein of the Spleen, and having bound with a Thread the Orifice of the Vein, I blew into the Tube, and wonder'd to see how much the Spleen swell'd with it, and when I forbore blowing, the Wind return'd upon me, and the Spleen sunk; which Experiment I tryed several times with like success.

This Experiment is much like the blowing Wind into the Lungs of any Animal, which when one leaves off returns back again: But forasmuch as in the Spleen by accident there was a little Hole, we could not produce that effect without stopping the Hole with one of our Fingers; and this Experiment I have not only repeated in the Spleen of Sheep, but also of Oxen and Cows.

They say that the Spleen consists of a spongy Flesh. I must own I could not discover that; for I allow of nothing to be Flesh, but where the Parts are extended in length, and lye in a regular order by one another, and so compose a Muscle, and the ends of these Flesh Particles are joyn'd in a Membrane, or make a Tendon of a Muscle; whereas the parts of a Spleen (at least as they appear to me) setting aside the Fibrous Parts, the Arteries and Veins, are compos'd of very small Particles, which were so exceeding fine, that I could give you no Figure of them; and it seemed to me, that as the said Fibrous Parts, spread themselves out into an unspeakable number of very small Branches, the said very small Particles are depending on the Fibrous Parts.

One cannot so separate these small Particles of the Fibrous Parts, in order to set them before the sight, but one must break and dissolve not only the very small Branches of the Veins of the said Fibrous Parts, but also of the
Veins

Veins and Arteries themselves, the more because that the Arteries are conveyed into the Membrane only by the very small Branches: Yet it happened to me once, that I cut a Slice of the Spleen at the thinnest end of it, one part of which remain'd fastened to the said Spleen, in which I observed an Artery, with several of its Branches, lying across the said Fibrous Part, without being joyned to it, only the extream Parts or Branches thereof, as far as I could discover, insinuated themselves into the Membrane.

Now that this was really an Artery, and no Vein, I was fully satisfied, partly because the Tunick or Coat thereof was very thick, and partly that it was a Blood Vessel, because the Cavity where it was cut off appeared very plain to me, which I could trace almost through the whole length of it; besides I imagine that the Veins, by reason of the thinness of their Tunicks, could not undergo so many Motions or Postures as I was obliged to put them into, in order to expose the Fibrous Parts plainly to the sight.

Thus far had I brought my Observations, which I had made only in order to review them at any time, but being informed that a certain Gentleman having writ something about the Spleen of a Man, had amongst other things affirm'd, that the said Spleen was not compos'd of Particles of Flesh; and moreover, I having been very free in delivering my Thoughts about the Contexture and Motion of the Spleen, I thought fit to place a small Particle (as I had prepared it) of the Spleen of a Lamb that was about a year old before a Microscope, and to cause a little part of it to be Painted, concluding that the Spleen of a Man, an Ox, or a Sheep, are of much the same Nature one with another, though perhaps their Figure either in length or thickness is something different; thus declaring that I shall not depend upon the Discoveries of any other Person.

Tab. II. Fig. I. Represents a very thin and small Slice that I had cut off the Spleen of a Lamb, from the thinnest part of it; for if I had cut off a piece from that part which was much thicker, it would have made too large a Figure.

In the said Fig. 1. is represented by A. B. C. D. E. a small Particle of the Membrane of the Spleen, like other Membranes, but exceeding thick and cover'd with another that was thinner; from the innermost Membrane does proceed the Fibrous Parts that lye between B. H. and G. F. and seem to be torn off from the small parts of the same.

The opposite Membrane is represented by O. P. having also other Fibrous Parts fastened in it at Q. R. S. T. from whence it plainly appears, that the Fibrous Parts are one and the same, tho they proceed from two opposite Membranes; and forasmuch as the Spleen has none of those Flesh Particles of which the Muscles are compos'd, and which are the Instruments of all Motion, these Fibrous Parts, I conclude, perform the same Uses as the Muscles.

Here we may see how wonderfully the Fibrous Parts, that are already describ'd between B. H. and F. G. spread themselves into Branches, and are again united in H. L. and M. L. from whence again they are multiplyed into many more small Sprigs; and I have seldom observed that any Membrane, how thin soever I had dissected it, was provided with so few Branches as are here represented between B. H. and G. F.

In the Fibrous Parts that lye between L. M. N. and Q. R. S. T. there are abundance of exceeding small Particles, very great Numbers of which were broken by me and cast away; all which I conclude are composed of exceeding small Particles which make the Spleen, and which small Particles I imagin to proceed out of the Fibrous Branches, which upon account of their smallness appear to me to be little small Globules.

The Fibrous Branches represented by V. V. V. are those that were cut off with a Knife.

Forasmuch as it was not easie to discover with the Eye, how the said Fibrous Parts, with their Branches and Roots, did proceed out of the Membrane, I caused the Painter to view a small Particle of the same thro' the Microscope, just as 'twas fasten'd in the Membrane, as may be seen in Fig. 2. which Membrane is there represented by A. B. as are also three Branches by C. D. . D. E. and E. F. All which are united in the Fibrous Branch C. H. I. and then we saw how each of the three said Branches, with those Parts thereof that I call Roots, were proceeding out of the Membrane, as is here shown in Fig. 2. between F. K. . E. L. . D. M. . and C. N. inso-much that the Painter said to me, that he never in his life saw more Roots with his naked Eye growing out of a Tree that was thrown down with the Wind, than he saw in this Figure.

That we may have a more exact Idea of the Structure of the Spleen, I handled some parts thereof much more gently than I had done the greater, that I might lay the Fibrous Parts naked ; after which I placed a small Particle thereof before a Microscope, and caused the Painter to describe the same as well as he could.

Fig. 3. A. B. C. D. E. F. G. H. I. represents a little piece of the Spleen, which to the naked Eye was no larger than a course Grain of Sand. In which Figure between A. B. and A. J. you don't only see the small Branches that shoot out of the Fibrous Part, which are also compos'd of much smaller Parts themselves, but one discovered also in the said small Particle, that it self in the length of it did also consist of long Particles like Fibres. Then who knows, but each of those fine Particles are Tubes or Vessels, to convey that very thin Juice or Liquor which they receive out of the Membrane.

In the said Fig. between B. C. D. H. I. are represented the exceeding small Branches, with their several small Parts issuing out of the said Branches; and between E. F. and G. there lay a Branch that was almost single, upon which the Painter has also represented the round Particles growing upon the same. From which Sight we may very well conclude how the Fibrous Parts represented in Fig. 1. are composed, setting aside the Veins and Arteries which run through the same.

A few weeks ago there came two *English* Gentlemen to my House, who askt me some Questions about the Sting of a Flea; but tho I could not then show them the same, yet afterwards it happened, that in dissecting of a Flea, in order to take the Heart out of the Body, the Sting of the said Flea appear'd to me much more plainly than I had ever seen it before; and the more by reason that I had broke off the two Fore-legs, which are as it were join'd to the Head, and then plac'd the fore part of the Flea before the Microscope just as if it lay upon its Back; by which means the Sting of the Flea appear'd so distinctly, that I my self could discover an Orifice in the extreame part of the same, and moreover it appear'd to me that it had a Cavity throughout; but that which surprized me most was, that the Sting of the said Flea had a Scabbard or Sheath, in which the Flea shut up his Sting when he did not use the same, and to preserve it from any hurt; and I imagin that the Flea could so order his Sting with the Case thereof, as to place it between his Legs, that it might not be entangled in his Hair or Wool when he run along.

This Scabbard of the Flea is divided into 2 parts, and each of them has a Cavity like a Canal, in order to contain the Sting when those Parts are close shut together; but that which was most remakable to me was, that each of those hollow Parts, that compose the Sheath or Scabbard, was compos'd of Parts like the Teeth of a Saw. These
Teeth,

Teeth, I conclude, are so made as to indent one within another when the Sting is in the Sheath, in order to hinder the opening of the same at any other time than when the Flea would make use of it: Yea, that which is more, we discover'd at the end of each of the Scabbards 3 Teeth standing out, which I judge was for no other end than to shut within one another.

I caus'd the Sting with the Sheath thereof, so as they appear'd through the Microscope, to be drawn by my Painter, to the end, that one may comprehend the better the wonderful Figure of this Instrument in so despicable a Creature as a Flea is.

In Fig. 4. L. M. shews the half of the Scabbard of the said Sting, as also the Cavity therein, and the Teeth-like Saws, and the 3 Teeth at the end of it described by M. In the said Fig. 4. N. O. represents the other part of the Sheath, that is likewise adorn'd with the same sort of Teeth. Q. P. is the Sting itself, placed between both the Parts of the Scabbard, and P. represents the little Orifice or Hole in it.

Now if we suppose that each of the Parts of this Sheath, as also the Sting it self, are furnished with divers Muscles and Fibres necessary to produce all the motions that belong to them, the said Sheath and Sting may be deemed great Instruments, in comparison of those Muscles that produce their Motion: But then if we remove our Thoughts to those *Animalcula* that many millions smaller than a Flea, and consider also their respective Instruments for motion, &c. we cannot but be exceedingly amazed at the thoughts thereof.

Fig : III .

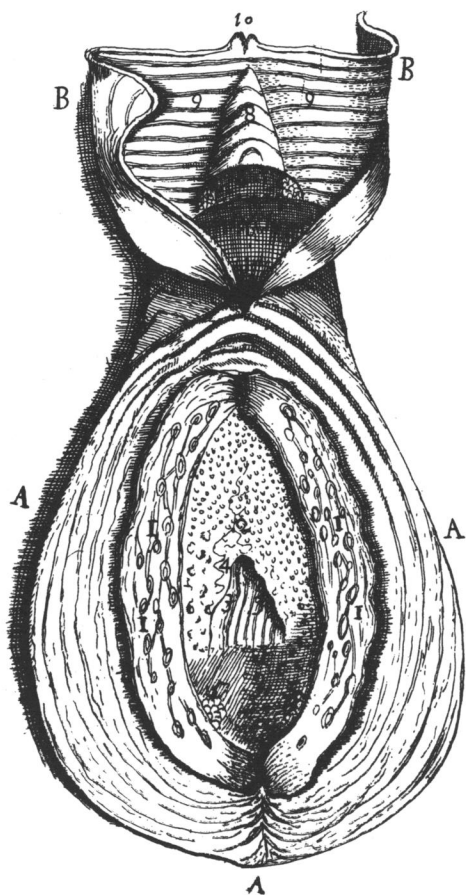


Fig : II .

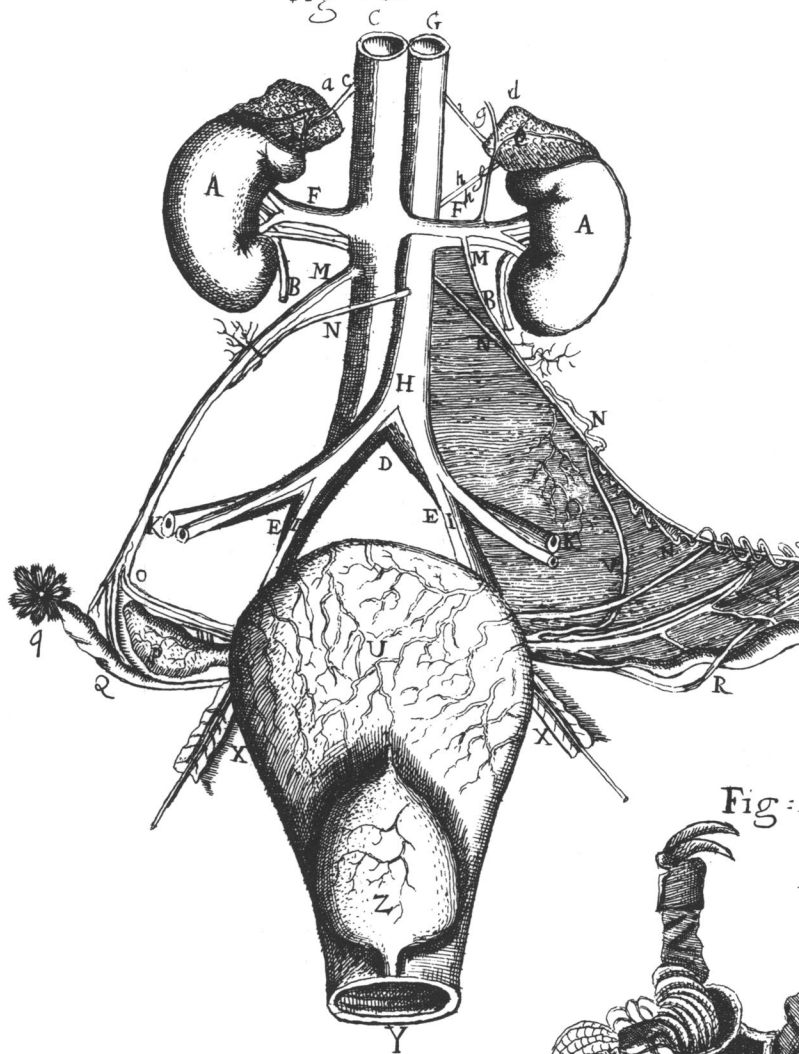


Fig :



Fig. II.

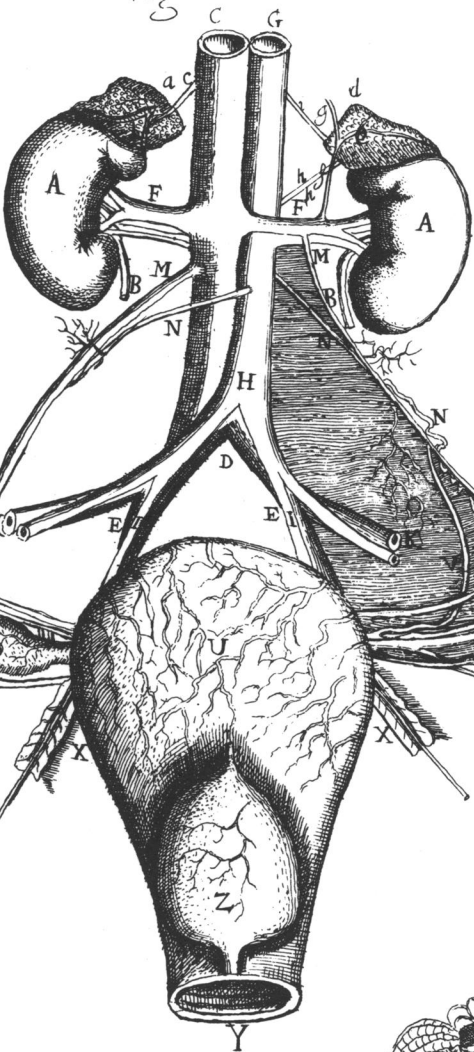
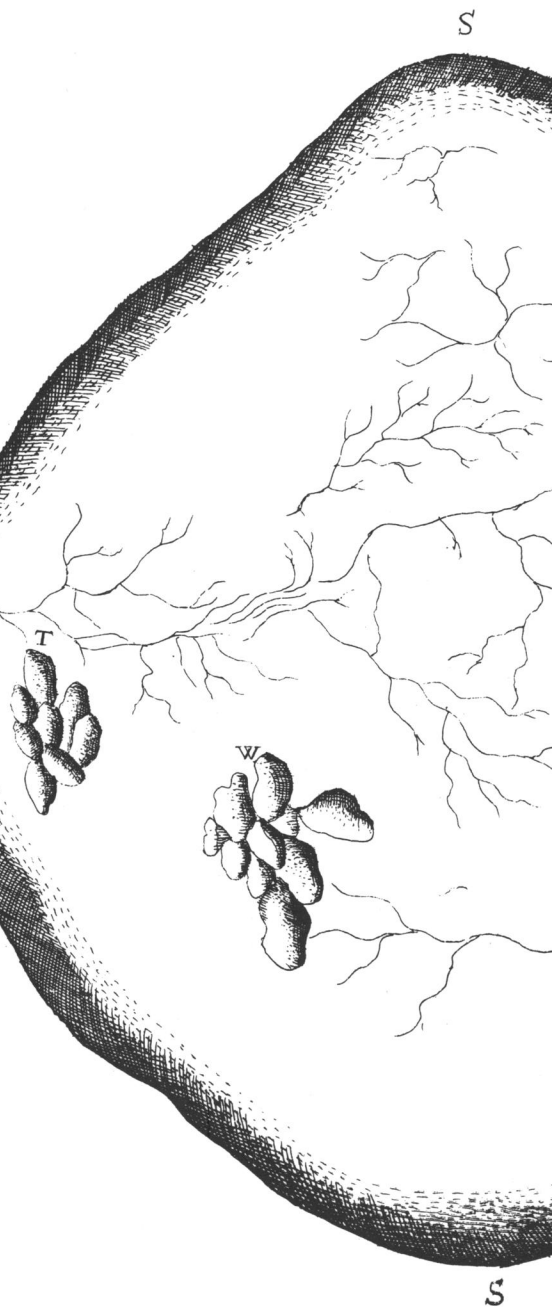
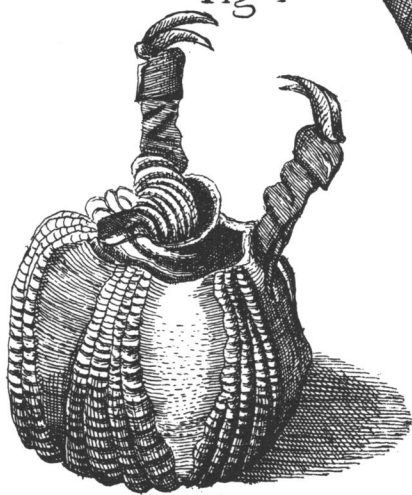
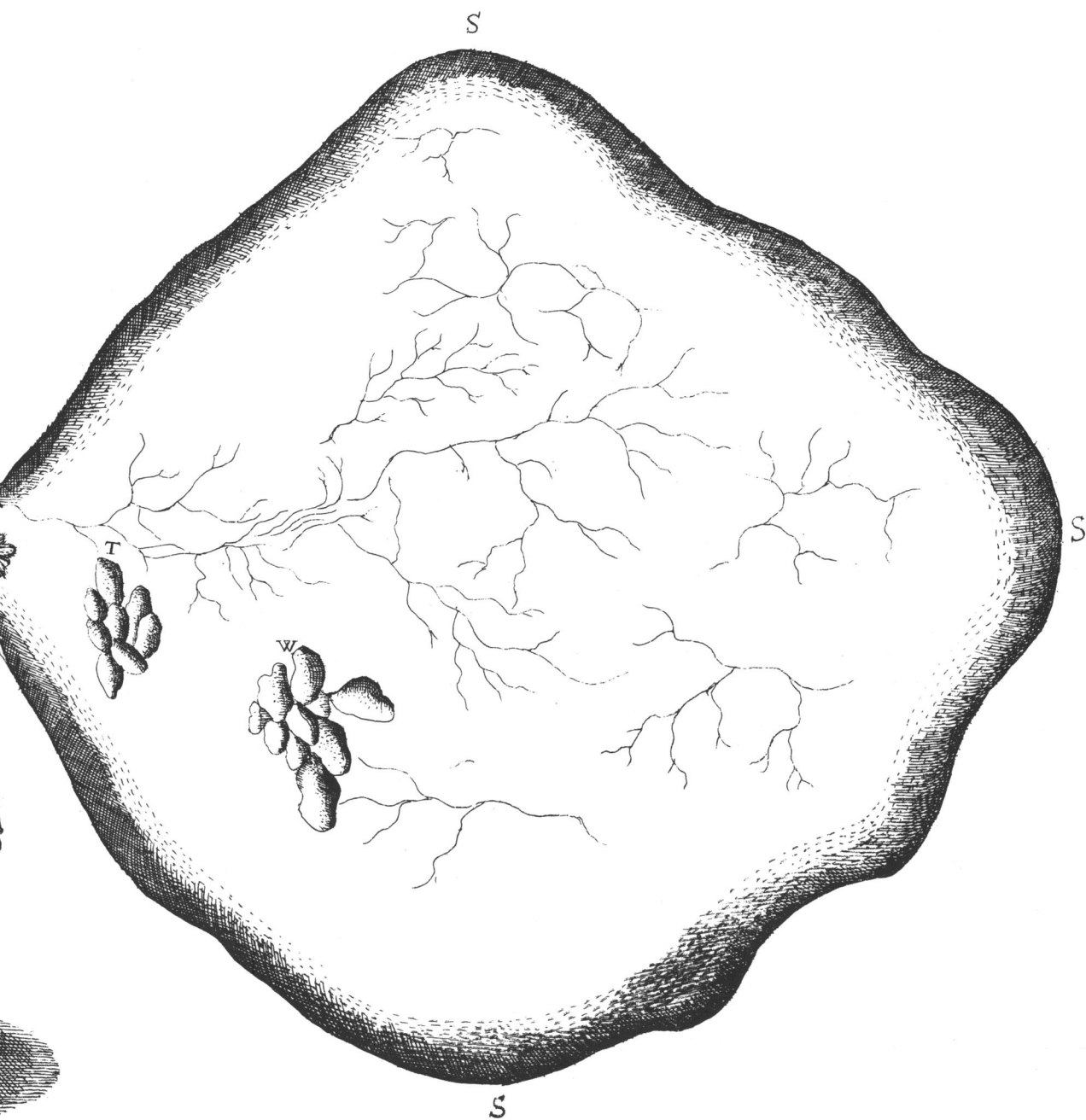


Fig. I.





PHILOSOPHICAL TRANSACTIONS.

For the Months of October, November and December, 1706.

The CONTENTS.

- I. *Part of a Letter from Robert Sibbald, Kt, to Dr Hans Sloane, R. S. Secr. concerning a Second Volume of his Prodromus Historiæ Naturalis Scotiæ ; with a Description of the Pediculus Cæti, &c.*
- II. *An Account of a Hydrops Ovarii, with a new and exact Figure of the Glandulæ Renales, and of the Uterus in a Puerpera. Communicated by Dr Douglas, F. R. S.*
- III. *An Account of an Experiment made before the Royal Society at Gresham-Colledge, touching the Extraordinary Electricity of Glass, produceable on a smart Attrition of it ; with a Continuation of Experiments on the same Subject, and other Phænomena. By Mr Fr. Hauksbee, F. R. S.*
- IV. *Vindiciæ Matheseos Universalis Gregorianæ contra secundos Abbatis Galloyfii impetus in Historia Acad. Scient. An. MDCCIII.*
- V. *An Account of a Storm of Rain that fell at Denbigh in Wales : Communicated to Dr Hans Sloane, R. S. Secr.*
- VI. *An Observation of a Tumor on the Neck, full of Hydattides, cured by Mr Anthony Hewnden, Surgeon : Communicated by Dr Edw. Tyfon, F. R. S.*
- VII. *Part of a Letter from Mr Robert Taylor, to Dr Hans Sloane, R. S. Secr. concerning a Monstrous Birth.*
- VIII. *An Account of Dr Ehm's Treatise of St George's Bath by Landeck, in the Lordship of Glats near Silesia.*

I. *Part of a Letter from Robert Sibbald, Knight, to Dr Hans Sloane, R. S. Secr. concerning a Second Volume of his Prodomus Historiæ Naturalis Scotiæ ; with a Description of the Pediculus Cæti, &c.*

Edinburgh, Octob. 8. 1706.

YOU ask in yours about the *Catologia* : I wrote it indeed in our Language about two years ago; but I find so few here curious of that sort of Learning, I judg'd it better to publish it in *Latin*, in the 2d Volume of my *Prodromus Historiæ Naturalis*, I am now preparing for the Press. There are many wild Plants, and many Minerals to be added, which were not mentioned before ; but the Bulk of it will be the *Fishes* and other *Aquatiles*, of which we have many rare and very remarkable : I have several in Plates, and am causing the others to be drawn.

Amongst them is this curious Shell Fish, Fig. 1. which Mr Foster, a Regent in the College of *St Andrews*, sent to our Colledge ; several of them he says were taken upon the sides of a Whale that was cast in there. Such another was cast in in *Edinborrough Frith* some 30 years ago. I gave a rude description of the Shell of that I got, in my *Auctuarium Musæi Balfouriani*, published Anno 1697. but this hath the Animal in it. We have got but one, else I had sent you one : I have sent the Figure of it drawn by an Artist ; if I had got another, I would have cut this in two, to have consider'd the inward parts, but this ought to be kept entire. It is the *Balanus Balanæ cuidam Oceani Septentrionalis adherens* D. Mart. Listeri, *Hist. Conchil.*

The

The *Pediculus Ceti Bocconi*, who, for ought I know, was the first that mention'd it, in his *Recherches & Observations Naturelles*. His Description of the Shell is better than the Figure he giveth of it. I presume to give you my Remarks upon it for want of better, which I must intreat you to take in good part.

The Shell approacheth to a Sexangular Figure, and consisteth of one Valve, in which point it differeth from all the *Balani* I have seen: It hath no Spiral Circumvolutions nor Apex, but it openeth at both ends; the Orifice of the upper end is narrower, and it is through it that it puts forth its *Cirrhi* or *Brachia*. The Orifice of the lower end is much broader, and the Animal is lodged in it. The lower is divided, as *Boccone* observeth, into 18 Lines, which are raised, 12 of them are simple and straight, and the other 6 are branched: The last are so placed, that two straight Lines are betwixt each of them. There is a cavity betwixt all of them, in which the *Cirrhi* or Arms of the Animal are probably placed, tho in this subject they stood in the middle of the upper part of the Shell, with their ends contracted as the Figure sheweth them; for the upper Orifice is deeper than the lower. They were altogether within it, but we raised them with the Leg of a Compass to the posture that they appear in the Figure. There is an opening from the under part to the upper, by which these *Cirrhi* mount from the Head of the Animal. The Orifice of the upper part is narrow below, but wide in the middle, and then again contracts somewhat. The Body of the Shell is Convex; it hath 6 divisions, each consisting of 4 Tubes extuberant; which are narrower at the upper end, but grow sensibly wider towards the lower end: The utmost of these Tubes are narrow, the middle are broader, all of them have *Striae* crossing them; the distances betwixt the parts of them are smooth and appear hollow; the Superficies of them are wider at the top and grow narrower sensibly towards the bottom. All the
Tubes

Tubes are hollow in the inside, making cavities betwixt the Lines, both simple and branched, which compose them. They arise from the Orifice in the middle of the inner part of the Shell, and proceed toward the sides of it; the branched part is nearest the side of the Shell. This is what I could observe of the Shell, upon both the outer and inner side of it. To come now to the Animal: In the upper part appear'd like a Mouth gaping; the upper and lower parts were both semicircular, but narrower towards the point of the Overture: They were membranaceous; and took their Rise from the inside of the Shell. The upper Lip, if I may so call it, was altogether membranous, the lower seem'd of an ossious consistence towards the Shell, and appear'd like the *Dentes molares*: A little below the Mouth appear'd the *Cirrhi*, which were continued with the rest of the Body of the Animal. I doubt not but when the Animal is alive, the under part below the *Cirrhi* doth resemble the under part of the *Mollusci* of the Polypode kind: This did resemble the *Parenchyma* of a *Buccinum*, but was much firmer, and when it was press'd it yielded a fat Juice; it was white without, but blackish where it adhered to the Shell; it was all drawn up within the under part of the Shell, which it fill'd: It was somewhat exsiccated, and so I could not perceive any distinction of parts in it, tho some are of opinion there may be *Viscera* and Vessels traced in it when the Animal is newly taken. This is what I could observe of the *Parenchymous* substance in the lower part. You see in the Figure two Sinewy Bodies, which arise from the sides of the upper part of the Shell, the one exactly opposite to the other; they end as it were in two Claws; by these it is like the Animal attacheth it self to any thing; and by these it hang to the Whale; it can dilate and contract them as it pleaseth: So it giveth us a new sort of Creature of the *Polypus* kind, which seemeth to be peculiar to some sort of Whales in our Seas, this being the
 second

second cast in upon our Shore in my time. There is so little to be seen in the Natural History relating to such Animals as this, I thought this rude account, such as it is, would not be unwelcome to you.

II. *An Account of a Hydrops Ovarii, with a new and exact Figure of the Glandulæ renales, and of the Uterus in a Puerpera. Communicated by Dr Douglas, F. R. S.*

I Lately opened the Body of a Woman, aged 27, who dyed the third day after Delivery, on which I made the following remarks.

1. She measured round the Waste a yard and three quarters, and from the *Scrobiculus Cordis* to the *Os Pubis* a yard and a quarter.

2. All the cutaneous Veins of the *Abdomen* were of a very unusual and extraordinary bigness, and very much distended with Blood. From the largest of them, being opened, I extracted several polypous concretions.

3. The *Cuticula*, from the *Umbilicus* downwards, was rough and scaly to the naked Eye. In several parts it appeared gangreened, occasioned probably by the sharpness of the *Serum* that always oozed out of it, when she scratched the little Pimples or Wheals that arose on its surface; these for some time used to go off without any Scar, but as her strength decayed they became mortified.

4. Upon all the *Regio Epigastrica* the outward Integuments were very thin, little or no fat being visible: But from the upper part of the *Regio Umbilicalis*, down to the

second cast in upon our Shore in my time. There is so little to be seen in the Natural History relating to such Animals as this, I thought this rude account, such as it is, would not be unwelcome to you.

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4. Upon all the *Regio Epigastrica* the outward Integuments were very thin, little or no fat being visible: But from the upper part of the *Regio Umbilicalis*, down to the

the *Os Pubis*, the Skin was almost half an inch thick, of a whitish colour and hard, some of it appearing as if it were granulated, caused by some obstructions in the Mil-liary cutaneous Glands.

5. The Fat under this part of the Skin did exceed the thickness of an inch, being distinguished into several Lo-bules of an irregular figure, and lodged in so many Cells adhering to the *Membrana adiposa*, which here also was much thicker than it usually is in a natural state.

6. Her Thighs, Legs and Feet were all *Anasarcous*, be-ing extremely big and swelled, easily retaining any Im-pression made by the Fingers: And her Nurse told me, that she used to wet a great deal of Linnen in drying up the Water, that would always issue out from these parts on the least rubbing, yet all her superiour parts were ex-tremely lean and emaciated.

7. The fleshy part of the *Abdominal* Muscles was much extenuated by the great distension, yet their Tendons were as thick as usual; and being very easily separable one from another, I could plainly observe that the Ten-don of the *Obliquus Internus* adhered firmly to that of the *Transversalis*, along the edge of the *Musculus rectus*, and was not double, as *Realdus Columbus*, and all Anato-mists after him, down to *Diemerbroek*, who was first a-ware of this mistake, have maintained: However this streight Muscle derives the same benefit from this situa-tion, being as it were hemm'd in on one side by this firm adhesion, and on the other by what they call the *Linea alba*, as if it had indeed been Inclosed between the two supposed Tendons of the *Obliquus ascendens*; that is, 'tis much strengthened thereby in time of acting. I observed also, that the Tendons of the two oblique Muscles, and the fleshy part of the *Transversalis*, between the Anteri-our Spine of the *Os Ilium* and the *Pubis*, near its com-missure, did inseparably join and unite with one another, forming as it were a thick and hard border, from the
out-

outside of which there was continued over the Blood Vessels, Nerves and Muscles, on the fore-part of the Thigh, a large *Aponeurosis*, which braced them down: The two *Laminæ* of the Membrane of the *Abdomen* being expanded on its inside. Now this border is what Authors call the *Ligamentum Pubis*, and what I have in another place supposed to be the firm union of the Tendons of these three *Abdominal* Muscles with the *Peritonæum*.

*Vid. Myograph.
comparat. Specim.
pag. 5.*

8. Having perforated the *Abdomen* in the most convenient depending part, for it would have been endless labour, considering the great bulk of the Tumour, to have laid it bare, by freeing it carefully from the Muscles and *Peritonæum*, there issued out with great Impetuosity in a rising stream a vast quantity of slimy Viscid Water, in colour and consistence very much resembling a brown, thick and ropy Syrup. This Water measured between 16 and 17 Gallons, besides what was lost on the floor, and imbibed in Sponges and Linnen made use of in drying it up.

9. When the Water was quite emptied, I fancied it had been all contained in a duplicature of the *Peritonæum*, and had made a Dropsy in that Membrane, because none of the *Viscera* appeared; for in such a case I have more than once observed, that the inner *Lamella* of that Membrane of the *Abdomen* being separated from the outer, is forced inward by the weight of the Water upon the Bowels, to which it closely adheres, contracting the Guts and Mesentery into a very small volume. But upon a narrower view I perceived that the thick Membrane, including the Water, could be easily separated from the *Viscera*, having freed it from its adhesions by membranous filaments to the *Peritonæum*, and by Blood Vessels to the *Omentum*. Now this Bag reach'd from the *Pubis* to the Midriff, and from the Left Region of the Loins to the Right; in a word, it filled up the whole cavity of the *Abdomen*, distending her Belly so far, that a Plate could easily lye upon it, when alive. Having gradually

freed it from all the neighbouring parts, and rolled it up, I found it adher'd inseparably to the Left *Tuba fallopiana*, the Spermatick Vessels being ramified upon it; and observing no *Ovarium*, which in the other side was naturally disposed, I concluded that the Bag was nothing but the Membrane of the *Ovarium* covering the *Ova* preternaturally thickned and distended by the collection of the above mentioned humour, and that the Distemper was a true *Hydrops ovarii*, inasmuch as all this vast quantity of Water was included in one Bag, being all of the same colour and consistence.

10. All the other *Viscera* in the *Abdomen* were found, and in their natural state.

11. In both Cavities of the Breast there was contain'd a great quantity of reddish Water.

12. The Liquor in the *Pericardium* was very abundant, and of a greenish hue.

13. The Right Lobe of the Lungs was tyed to the Membrane of the *Thorax*, covering the upper part of that cavity, but the Left was free from any adhesion.

14. In the Left Ventricle I found a large Polypous or Serous Concretion, of a round figure, a white colour, and of a pretty hard consistence, with several long Roots of a Red colour, which extended thro the Auricle and Bulb of the Pulmonary Vein into its nearest divarications in the Lungs.

Having carried home this large Bag, with the *Uterus* appendant, cut off below the Orifice of the *Meatus Urinarius*, and viewed it at leisure, I observed,

1. That the Right *Spermatick* Vein, which opens into the *Cava* a little below the *Emulgent*, was three times larger than the Left; and from a little above the *Ovarium* it was continued, without any division to its termination.

2. The Right *Ovarium* was in a very natural state. The *Cicatrix* or *Caruncula*, whence the fecundated *Ovulum*

um had dropt, was yet remaining, and the Blood Vessels were ramified upon this *Testis*, in a very pleasant and beautiful manner.

3. The *Tuba Fallopiana*, with its *Fimbria*, were all well disposed.

4. The Diameter of the Left *Spermatick* Vein, which opens into the *Emulgent* of that side, was much less than ordinary. And from the extraordinary narrowness of the bore of this Vessel we may draw a not very improbable Reason of some Cause of this Watery Swelling; for the Blood being hereby hindred in its Reflux to the Heart, a great deal of *Serum* or *Lympha*, thro its slow return, must needs be thrown off upon the *Ovarium*, already indisposed, whence the gradual Increase of the Tumor did proceed.

5. The two *Spermatick* Arteries were contorted, and full of turnings and windings, from their meeting with the Veins to the *Ovaria* and *Tubæ*.

6. A little below the Kidneys each Artery sent out a Branch, which was lost on the *Peritoneum*, and fatty Membrane of the Kidney: And from the same places the Veins received two considerable Branches.

7. One of the Arteries went off by a narrow Orifice from the side of the *Aorta*, the other rose up from its middle, a little below the first.

8. Between the Bag and the *Uterus* all these Vessels were much dilated, making several Turnings and Circumvolutions upon the *Peritoneum*, called in this place the *Ligamentum Uteri latum*.

9. The Left *Tuba Fallopiana* was only remarkable in its being much longer and larger than usual.

10. In the Bag, which was nothing but the Membrane called *Dartos*, which covers all the *Vesicular* Glands of which the *Ovarium* is compos'd, I observ'd several little Bladders of different sizes, distinct from one another, which contain'd a limpid or clear slimy *Serum*, in Colour
and

and Consistence like a Mucilage of the *Semen Cydoniorum*, these were either *Hydatidal* Tumors only, or the Eggs themselves distended. This Liquor hardened by a slow heat into the Consistence and Colour of the White of an Egg.

11. All the *Fundus Uteri* was about an inch and a half thick, but near the *Collum minus* it grew something thinner, which did proceed from the distention of its Spongy and *Vesicular* Substance, by the Blood in the Vessels running thro it in variety of turnings and windings; so that when it was cut, it very much resembled the substance of the Lungs.

12. Upon the inner Membrane of the *Uterus* I observed, upon wiping it with a Sponge, several little eminencies, which I took to be the Glands mentioned by *Malpighius*, which separate a Humour, to Lubricate and Moisten its cavity.

13. On the upper part of the *Fundus Uteri* I took notice of a great number of small Vessels, like slender Filaments or Threads, running off from its Membrane, and terminating into a reddish and soft spongy sort of substance, not unlike the *Uvula*, bating its colour, which hung down from that side of the Womb in form of a Nipple. These perhaps are the Vessels, which, in the opinion of some, do separate and excern the Matter of the *Lochia* and the *Menses*, they being only visible at those times.

14. Near the beginning of the *Tubes*, I perceived two *Tubercles*, or little Bunchings, about the bigness of a Nut, to which perhaps the *Placenta* was fastned, and to these adhered several Glandules of a Blackish colour, of different sizes.

15. The *Collum minus* was composed, as it were, of two *Labia*, the uppermost was most protuberating, and upon it I observed several small Glands, out of which, upon compression, issued a viscid clear Liquor, which is
said

said to seal and close up this part, in time of Pregnancy. The lower *Labium* was longer and thinner, its Edges being cut or indented in several places.

16. The *Rugæ* in the lower part of the *Vagina* run as they are represented in Books, but those in the upper part had a quite different course, as they are exactly delineated in the annexed figure.

17. Near the Orifice of the *Meatus Urinarius* there were observable two very large Caruncles, in shape like a Mulberry.

This is what I observed in the opening of this Woman. I come in the next place to relate, as far as I was informed, the Symptoms that accompanied her big Belly, and the Method made use of for her Recovery.

About three years ago, not long after she had lain in of her first Child, she had a violent blow upon the Left side of her Belly, very painful for the present, but in two or three days, upon keeping herself quiet in Bed, the pain and anguish went off. About two months after this, she began to feel some small pains in the Left *Hypogastrick* Region, where she had lately received the Blow; and she observed that side of her Belly to grow abundantly bigger than the other: These pains increased more and more, till they grew very violent, but upon Conception, which was three months after she was first afflicted with them, they went off, and her Belly swelled gradually, as is usual in Pregnancy, having no other Symptoms but what is incident to that state, only she was much bigger than ordinary; and on that account she forbore the use of Medicines, which possibly might have been effectual in her beginning Distemper, had she been well aware of her Danger.

After Delivery, the swelling and bulk of her Belly continued much the same as before the Birth, only upon a plentiful evacuation of the *Lochia* it decreased a little. When her month was up, she advised with several
Phy-

ficians, Apothecaries, &c. who used Emeticks, strong Catharticks, Diuretick Dyet-drinks, and all the train of Medicines commonly used in a *Dropfy*, her supposed case. All the effect they had, was to prevent the farther Increase of the Swelling while she used them; but, being weary of the trouble and charges to no purpose, she left them wholly off, and then the Tumor increased very remarkably.

Thus she continued about one year, and then she Conceived again, which she suspected by the stoppage of her *Catamenia*, having always been very regular but at such a time. Her Stomach was always good, she never was very thirsty, so drank but little, made Water freely and in great quantity, and was attended with none of the Symptoms of an *Ascites*, except the Swelling of her Belly: Only when she was half gone, her Legs began to swell and pit, growing very big all of a sudden; from these, and likewise from her Belly, there would often issue out a great deal of watery Humour upon rubbing, as I have mentioned already, especially if she scratched the little Pimples, that would often arise in these parts. About this time she began to be afflicted with a difficulty in breathing, with a violent Trembling and Palpitation of her Heart, and to be often subject to great and involuntary Sighings. She was not able to lye down, but was still obliged to sleep in a sitting posture, for fear of being choak'd. Now I think it probable, that all those Symptoms did proceed from the Deluge of Water contained in the Cavities of the *Thorax* and the *Pericardium*; which no doubt did more effectually hasten her end, than the bigness of her Belly, with which she might have lived several years.

After she was brought to Bed of a live Child she became exceeding weak, being unable to fetch her Breath, and complained much of a heavy Load and Oppression on her Breast; and the third day she expired.

The

The Explanation of the Figures.

Fig. 2. *Representeth the Glandulæ Renales, the Uterus, with the parts belonging to it, and the large Bag or Membrane of the Ovarium præternaturally distended.*

- a *The Glandula Renalis on the Right side.*
- b *An Eminence, or rising in its middle.*
- c *A Vein that runs from it to the Cava.*
- d *The Glandula Renalis on the Left Side.*
- e *A Sulcus or Furrow in its middle.*
- f *A Vein running from it to the Emulgent.*
- g *A small Vein that comes from the Diaphragm, and opens into this Vein before it leaves the Gland.*
- h h *Two small Arteries from the Aorta.*
- i i *Two Nervous Twigs from one of the Intercoastal Plexus's.*
- AA *The Kidneys.*
- BB *The Uterus cut off.*
- C *The Cava cut off.*
- D *Its Division into the Ramî Iliaci.*
- EE *The Internal Branches into which the Hypogastricks open.*
- FF *The Emulgent Veins.*
- G *The Aorta cut off.*
- H *Its division into the Iliacks.*
- II *Its Internal Branches, which are spread upon the Uterus.*
- KK *The external Iliacks of both Vessels.*
- LL *The Emulgent Arteries.*
- MM *The Spermatick Veins.*
- NNNN *The Spermatick Arteries, very much contorted in their Progress, that on the Right side being cut off.*

O *The Union of the Branches of the Spermatick Vein on the Right side.*

P *The Right Ovarium, with Blood Vessels ramified on its outer Membrane.*

Q *The Right Tube.*

q *Its Fimbria.*

R *The Tube on the Left side, its Fimbria adhering to the large Bag.*

SSS *The Membrane of the Left Ovarium, distended to a vast Bigness, with the Blood-Vessels ramified upon it.*

T *Some of the Ovula grown big.*

W *Some Hydatidal Tumours on the Inside of the Great Bag.*

VVV *The Ligamenta lata.*

U *The Fundus Uteri.*

XX *The Ligamenta Rotunda; the Membrane that covers them, being laid open, that the Vessels of which they are compos'd may be view'd.*

Y *The Vagina cut off.*

Z *The Vesica Urinaria.*

** *A small Artery and Vein on each side, the first going off from the Spermatick, is spread upon the Membrana Adiposa and Peritonæum under the Kidney; the latter bringing back the Blood from these Parts, opens into the Spermatick Vein.*

Fig. 3. *Sheweth the Vagina and Uterus cut open.*

AAA *The Fundus Uteri laid open, and its sides folded back.*

Fig. 4. *The inner Spongy Substance, with the Orifices of the Hysterick Vessels.*

22 *The Glands appearing on the Inner Membrane of the Uterus.*

33 *The small Vessels, by which the Lochia, &c. are separated.*

4. *A soft substance, depending from the Upper Part of the Uterus, into which the foresaid Vessels terminate.*
 5. *Two Tubercles, seated near the Beginnings of the Tube, to which the Placenta adher'd.*
 - BB *The Vagina laid open.*
 6. 6. *The two Labia of the Collum minus.*
 7. 7. *several small Glands plac'd on the Upper Labium.*
 8. *The Course of the Rugæ on the upper side of the Vagina.*
 9. 9. *Their direction on the under side of that part.*
 10. 10. *Two Orbicular substances, near the Orifice of the Meatus Urinarius.*
-

III. *An Account of an Experiment made before the Royal Society at Gresham-Colledge, touching the Extraordinary Electricity of Glass, producible on a smart Attrition of it ; with a Continuation of Experiments on the same Subject, and other Phenomena. By Mr Fra. Hauksbee, F. R. S.*

I Took a Hollow Tube of fine Flint Glass, about an Inch Diameter and 30 in Length, which having rubb'd pretty smartly with Paper in my Hand, till it had acquir'd some degree of Heat ; it was then held towards some pieces of Leaf Brass, which so soon as its *Effluvia* had reacht, became suddenly in Motion, flying towards the Tube, even at 9 or 10 Inches distance ; and it seem'd that the hotter the Tube was made by Rubbing, the farther it would Attract, but that it would do so to any Degree of Heat, I dare not determine. And what farther observable was, That sometimes the Bodies Attracted would adhere to the Tube, and there remain quiet. Sometimes would be thrown violently from it to

good Distances: Sometimes in their Motions towards, and sometimes even touching it, they would suddenly be Repell'd back to the distance of 4 or 5 Inches, repeating the same several times with great Velocity in a very surprizing manner. Sometimes the Bodies would move but slowly towards the Tube, sometimes remain a small time suspended between the Glass and the Table on which the Brass Leaf was laid; and sometimes seem to slide along the sides of it without touching. All which *Phenomena*, altho they do not happen at every Tryal exactly as I have here deliver'd them, yet I have sometimes seen them, and in a great measure at all times, are very agreeable to this account, notwithstanding the Force and Vigour of the *Effluviu*m is sometimes less than what at other times I have found it. The Reason of which seems to me to proceed from the Different Temperatures of the Air at the time the Experiments are made; for when it happens that abundance of Humid Particles (as sometimes there are) are swimming in the Air, there is no difficulty to believe, but the Resistance of such Particles may mightily impede the Force and Extent of the *Effluviu*m: Or, which is much to the same purpose, suddenly Condense on the warm Tube, thereby Hindring or Choaking the Passages of the *Effluvia*. For I find Moistness at all times an utter Enemy to Attempts of this nature; besides, the quality of the *Effluviu*m seems to be such, that I could not (in an Experiment lately made) with all my endeavours, cause it to affect one of the premention'd Bodies thro a piece of fine Muslin, notwithstanding it was held very near it, and at the same time would Attract or give Motion to the same Body at three or four times that distance, the Muslin not interposing. Moreover, I cannot tell but the Coldness of the Air at the same time may Concur; for when this Experiment was first made it was Summer time, and Dry Weather; and then it seem'd to me to succeed something better than it has
done

done of late : Yet the least of its Performances under the foremention'd Inconveniencies is very notable. But to proceed : When the Glas became hottest by the greatest Attrition, it did then send forth such quantity of *Effluvia*, not only performing the Effects before-mentioned with seemingly greater Vigour, but being nearly apply'd to the Face, or any tender part, might be sensibly felt, as if the Part was pusht with the points of a considerable number of weak Hairs. In this place I think it will not be amiss to take notice, That, considering the Vigorous Action of the *Effluivium*, I thought it would not be unnecessary to attempt a discovery of the figure of its Motion, by Approaching the Affricated Tube to the flame of a Candle, Smoak, Steem, Dust, and to the Surfaces of Liquids ; which I did without any manner of success : And which I wholly attribute to the reason before given, of the Humid *Effluvia* suddenly Condensing on the Warm Glas ; so the Oleagenous Quality of the Flame and Smoak, the Moistness of the Steam, the Smalness of the Dust, or the *Effluvia* of the Liquids, would immediately adhere to all parts of the Affricated Tube, as it was approacht within their Spheres, preventing the Operation of its *Effluvia*, which then seem'd to be stopt, or retir'd within itself ; and requir'd a new Attrition to give it vent.

What next occur'd in this Experiment was, That upon exhausting the Air from within the Tube by the Pump, then altho the like Attrition or greater was given it than before, yet very little of the *Affluivium* could be discoverable, by any motion or disturbance given the Leaf Brass, notwithstanding it was held within a quarter of the distance, at which it had been attracted before. After this had been continu'd for some time with little success : I say with little success, Because, sometimes small parts of the Leaf Brass, when the Tube was held near, and at the same time very warm, would
have

have a Motion given them; but without Comparison to what it did when the Experiment was made with it unexhausted of its Air. Besides, I doubt not but some small quantity of Air might be left in the Tube, and so the Attraction to continue in proportion to the Quantity of the remaining Air. Or the Heat that is produc'd upon the smart Attrition of it, may as well in this (I think) as in other Experiments, supply the Effect and Space of such a quantity of that Element: Upon letting in the Air again, it was worth taking notice, That before any new attrition was given the Tube, or was remov'd from the Position and Distance it was held in when *in Vacuo*, that several of the premention'd Bodies at Rest, (as to fence) began suddenly to move, and were some of them attracted to the Tube, which, upon a fresh attrition, its Electrical Quality recover'd as vigorous as at first. Thus far the first part of the Experiment.

Now the Attrition of the Tube being made in the dark, it was very observable, that when the Glass became warm, a Light would continually follow the Motion of the Hand, backward and forward; and at the same time, if another Hand was held near the Tube, a Light would be seen to break from it with noise, much like that of a Green Leaf in the Fire, for smartness, but nothing so loud: Altho when the Experiment has been very silently made, I have heard several Cracks at 7 or 8 feet distance, or more; if any thing else as well as the Hand was brought near it, a Light would fix upon it, notwithstanding it touch'd it not, as I have try'd with Gold, Silver, Brass, Ivory, Wood, &c. giving much the same appearance as the Hand. But after the Glass came to be exhausted of its Air, then upon the first Attrition of it, a much larger did ensue; but the quality of giving a Light to a Body approacht near it, seem'd to be quite lost. I conclude this Experiment with taking notice,

tice, That the Light produc'd upon the Attrition of the Exhausted Tube, appear'd wholly within it ; and that which was discover'd upon the Affrication of it unexhausted, seem'd to be altogether on its outside.

Postscript.

Since this Account was wrote, I procur'd a solid Tube, about the bigness and of the same Metal with the other ; but upon tryal of it find no great Difference in its Operations, in comparison with the other, only its *Effluvium* seem'd to continue a little longer, but attracts not at a greater distance than the other that I can discover. With this new Tube I made the following Experiment, I took a little Lamp-black, and having dry'd it on a Paper before the Fire, and the Tube being rubb'd till it was warm, then being held near the Lamp black, it was not without pleasure to behold the Brisk Agitation of a number of the Little Bodies, seeming promiscuously Ascending and Descending with great velocity : And it was admirable to see, that Bodies so light *in specie*, which by their own Gravity falling on Paper would make no fenceable noise, yet the same return'd with such force from the Tube, that their striking the Paper was very audible.

*A Continuation of the Experiments on the Attrition
of Glafs.*

I Procur'd a Glafs nearly Cylindrical, of the Length and Diameter about seven Inches each, whose motion was given by a Machine of a new Contrivance ; its Axis lying parallel to the Horizon, which in like Experiments heretofore made, was Diametrically opposite to it. With this new Method, after the Cylinder was exhausted of its Contain'd Air, and the Motion made by the Wheel, it succeeded in respect to the Light produc'd upon the Attrition of it, as in the Experiments formerly mention'd. But when all its Air had return'd into it, and the Attrition and Motion continu'd as at first, it was not a little surprizing to behold from the point of ones Finger to the Glafs, a vigorous Light, which began (as has been observ'd) at the Finger first ; and seem'd to Gravitate on it, being sensibly to be felt there, notwithstanding the Moving Body was not toucht with it by near $\frac{1}{2}$ an Inch : This Light seem'd to issue from the Glafs with a considerable noise, (not much unlike that of Wheezing, but smarter) and was easily distinguishable from that made by the Operation of the Engine, which was not a small one. Here observing the Vigorousness of the Light, and the Noise that attended the near touching Finger, when the Experiment was made in the Dark, I was willing to satisfy my self whether it would Exhibit any *Phenomenon* by Day light ; accordingly, one day in the Afternoon between 2 and 3 a Clock, in a very light Room, I found that immediately after the Attrition was made on the Moving Glafs, and the Finger approacht as before, a pure Purple Light became very visible to extend itself from the Finger to the Cylinder, and was accompany'd with the like premention'd Noise. This Experiment I
have

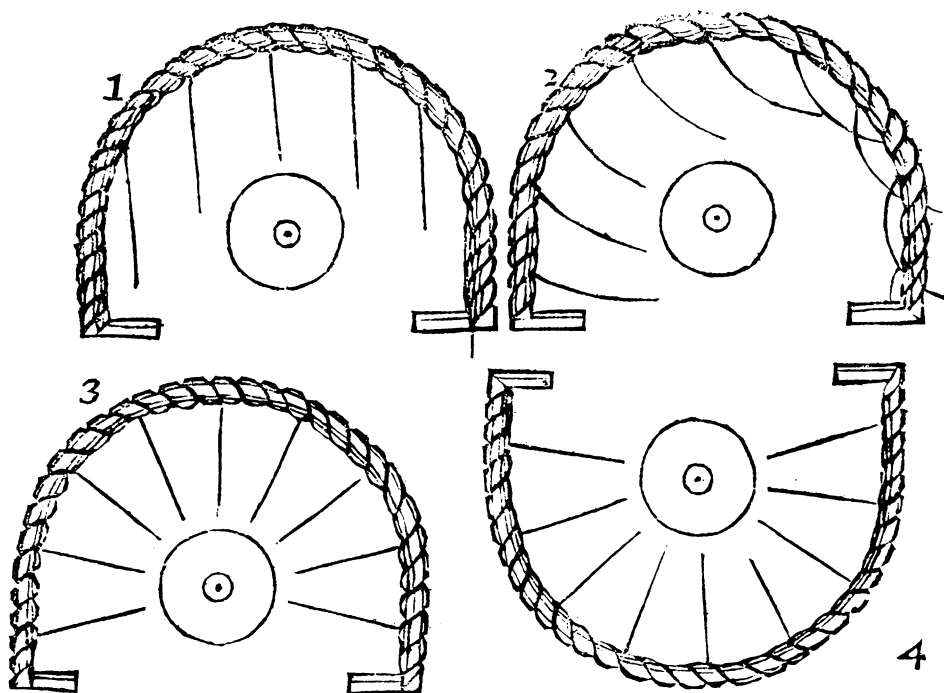
have repeated several times since at different hours, with the like success: It is always made with Glass unexhausted of its Air. To proceed. As to the Electricity of this Body upon such a Motion and Attrition given it as usual, I do not find that it exceeds in that quality what already I have related in former Experiments. I then took a piece of fine Muffin, which was sow'd to two Wires bent Archwise, that it might surround the upper surface of the Glass, almost at four Inches distance from it: The Muffin I made as ragged (by breaking the Threads of it every where) as I could, (for I find that Small and Light Bodies are most apt to be affected by the *Effluviu*m of Glass) then the Motion and Attrition being given, it was pleasing enough to see a Multitude of small Sparks of Light every where on the ends of the torn Threads, which resembled so many little Stars observable in a good Telescope in the *Via Lactea*; and the whole was attended with such a whiteness, by the little Light proceeding from them, as in that part of the Hemisphere taken notice of, by those who behold it with the naked Eye.

After that I tryed, whether the Addition of Heat, by placing a red hot Iron just under the Moving Glass, would advance any thing the appearance of Light, which I found without the Attrition of my Hand would do nothing, and with it no more, that I could discover, than if it had been absent; both, with the Glass exhausted of its Air and without.

Now what farther I have to add, occur'd from observing always that Light Bodies, approach'd near any part of the affricated Cylinder, would seemingly be equally Attracted, or Gravitate; so that I contrived a Semi-circle of Wire, which I could fasten at a constant distance, environing the upper Surface of the Glass at 4 or 5 Inches from it. This Wire had twisted round it some Pack-Thread, whereby I could with Ease hang

(2334)

the Threads at pretty nearly equal distances; the lower ends of which reaching within less than an Inch of the Glafs, when held approaching the Center of it, but appear'd, when at liberty, as in Figure the 1st.



And when the Cylinder was pretty swiftly turn'd about, those Threads would appear by the agitated Air, as in Fig. the 2d. But when on the lower part of the Glafs was applyed my hand, the Threads would then represent a Form like Fig. the 3d. And from all parts seem to Gravitate, or were attracted in a direct Line to the Center of the moving Body, suffering no Inconvenience or Disorder of Posture by the Wind occasioned by the Rapidity of the motion; and I could by shifting

ing the Attrition, draw them in a Line towards either end of the Cylinder ; yet still pointing to the Axis of it. And if the Wire with the Threads be revers'd, as I have tryed since, that is, encompassing the under part of the Cylinder, as before the upper, it answer'd exactly the same as the other ; the Threads all pointing to the Axis of it: See Fig. the 4th. I have likewise given a Motion to the same Glass in a perpendicular Posture, by which means I had the opportunity of placing a Hoop-Wire Horizontally, with Threads as before, and left only one small part expos'd for the touch of my Fingers between them ; yet the Threads upon the Motion and Attrition given the Cylinder, elevated themselves from their hanging Posture, making all round an Horizontal Plain, directing their loose ends to the Axis as in the other. Now how far this Experiment may serve to explain the Nature of Electricity, Magnetism, or Gravitation of Bodies, is beyond my Sphere to determine ; but with all Humility submit it to those Learned Gentlemen of this Honourable Society, who have already treated on those Subjects.

IV. *Vindiciæ Matheseos Universalis Gregorianæ contra secundos Abbatis Galloyfii impetus in Historia Acad. Scient. An. MDCCIII.*

DUODECIM abhinc annis (a) Jacobi Gregorii, Clarissimi Viri, patruī mei defensionem suscepi contra calumnias Abbatis Galloyfii, (b) qui & illum & celeberrimum Barovium, quasi Propositiones suas de *Transformatione Curvarum* a Robervallio surripuerint, apud orbem literatum criminatus est. Plurimis tum argumentis ostendi, quam hæc iniqua esset, imo inepta suspicio. Quandoquidem vero eorum famæ nondum parcat Galloyfius, sed eandem denuo litem redintegrat, (c) ne Robervallium illud, uti ait, illustre Parisiensis Academiæ lumen deferere, aut illius honori deesse ullo modo videatur: me certe non minus decebit, & meæ Gentis causam agere, & suum Patruo meo decus vindicare, Viro tanti inter Mathematicos nominis, ut si eum cum Robervallio comparem, minime verear, ne qui utrumquē norint, me in illius laude non satis modestum æstiment. At fuerit sane Robervallius, quantum fuisse eum Socii ejus Academici perhibent, imo quantum se Ipse in posthumis suis prædicat, ubi post paginam inventis suis numerandis insumptam, at Ego, ait, (d) *circa Arithmeticam Muscam Opticam Astronomiam Geometriam Geographiam*

(a) *Philosoph. Transact. Nov.* 1694. (b) *Hist. Acad. Reg. Paris.* 1693. (c) *Hist. Acad. Reg. Paris. An.* 1703. (d) *Oeuvres des Math. par Més. de l'Acad. Roy.* pag. 301.

*Piura quidem feci quam quæ comprehendere verbis
In promptu mihi sit.*

Sed illa omnia vulgaria æstimo : Et pergit deinde per paginam sesqui-alteram, nobiliora sua reperta, quæ Jovis auri-
bus servavit, recensere. Fuerit inquam hic vir quantum-
vis Egregius, tamen hac sui opinione, hoc fastu inflatus
haudquaquam prospera in Italos omnes Mathematicos
bella intulit, & tam infeliciter ei cessit rerum novarum
studium, ut vix unquam inventum aliquod suum aperire
inceperit, quin idem prius ab aliis vulgatum, ab aliis illius
laudem omnem præreptam jam & occupatam ægerrime
videret. Ubi ab Italis Cycloidem acceperat, statim in
illa (e) *Trochoidem suam agnovit, miratus quomodo illa ad
Italos pervenerit, eamque a Galilæo ante annos quadra-
ginta inventam sibi asseruit, ita ad eum modestius scri-
bente Torricellio, (f) Quoad Authorem hujus figure cre-
do ego ingenium tuum acutissimum & feracissimum observare
potuisse ostendente nemine ; attamen vivunt adhuc testes qui-
bus olim Galilæus irritas lucubrationes suas communicavit
circa hanc figuram, imo supersunt adhuc paginae aliquot Cla-
rissimi Mathematici in quibus picturas & aggressiones suas
nonnullas circa hoc subjectum jam Adolescens delineavit.*
Deinde cum communicatum illi a Torricellio ejusdem
Cycloidis centrum Gravitatis haberet, idque pro suo ven-
dicaret, ita questus est ad Mersennum Torricellius,
(g) *Quod certe imo certissime scio non habuisse Robervallium
antequam demonstrationem meam videret, ut Paternitas
vestra vel ipsemet, vel universa Europa testis esse poterit, &
aliâ Epistolâ (h) Quadraturas, inquit, ad Clarissimum Ro-
bervallium mitto fortasse ad subeundam eandem fortunam*

(e) Ibid. 279. (f) Ibid. 283. (g) Ibid. 298. (h) Ibid. 297.

cum meo centro Gravitatis Cycloidis. Neque hæc eum fefellit suspicio, quicquid enim in iis novum est aut pulchrum (i) sibi & Fermatio assumit, ac ne minimam Torricellio laudem relinquit. Qui itaque cum aliam a se inventam Propositionem Robervallio mitteret (k) *Oro te*, inquit, *ne inter vestra hanc etiam habeatis, hoc enim esset tollere omne literarum scientiarumque commercium.* Ne quid vero novum aliquis in lucem emitteret quod irreperitum Robervallio fuerit, etiam (l) Clarissimi Cavallerii Methodum Indivisibilium, integro quinquennio antequam ab eo in publicum prodiret, sibi notam & usitatam dicit. Bellum itaque, quod Italici jam diu frustra intentatum fuit, ne miremur ad Britannos demum migrasse; nec quod Galileo, Torricellio, & Cavallerio accidit, id quoque Barovio & Gregorio contigisse nimium ægre feramus. Imo potius miramur cur hoc tam sero contigerit. Septem enim annos post editum Gregorii librum vixerat Robervallius. An vero Ille, qui levissimam quamq; gloriolam captavit, qui nihil sibi non arrogavit, nihil cuiquam proprium esse voluit, has sibi propositiones suas eripi vivens videntque pateretur. At non viderat, inquit Galloysius, per tot annos nihil legerat novum, & omnibus se inventis spoliari facile passurus Famæ jam & Mathesi valedixerat. Miror quo ore hæc sua proferat commenta, quæ tam facile coargui possunt. Tantum enim abest ut Robervallius ab anno 1668 in secessu & ab eruditorum commercio remotus degerit, studiaque deposuerit mathematica, ut in Academia Parisiensi Matheseos Professor Anno jam 1670 novæ Stateræ inventionem Academiæ Scientiarum Regiæ communicaret (m) uti Acta eo anno impressa testantur. Interfuit itaque Robervallius Academicorum conventibus, &

(i) *Ibid.* 298. (k) *Ibid.* (l) *Ibid.* 285. (m) *Journals des Savans* 1670.

si ipse nihil tum legerit, nihil ne tamen de his adeo in Gallia celebratis Gregorii inventis ad illius aures fando pervenit? Nihil horum accepit ab Hugenio (n) qui tum temporis contra Gregorium inter Academicos acerrime disputavit? Vel si nulla illi cum Hugenio, ut Galloysius dicit, familiaritas intercefferat (forte quia præcipuam & maxime utilem *suae Trochoidis* proprietatem ab Hugenio inventam fuisse dolebat.) nihil a cæteris omnibus Academicis per universum septennium audire potuit. Aut si audisset, nihilne questus esset, ne ipsis quidem Fratribus suis & Amicis? Tam fuisse eum Gloriæ abstinentem haud temere quisquam credet, qui illius cum Italis, cum Suis, cum omnibus rixas intellexerit: aut saltem dicet, quantum ab illo mutatus est, quem modo sic locutum audivimus, (o) *Nos ætate aut tempore saltem priores ætatis aut temporis beneficia respiciemus, & junioribus aut saltem tempore posterioribus vivi adhuc relinquemus? Apage stultam illam in nosmet ipsos injustitiam.* Quod si repente factus est tam patiens, tam famæ aversus Robervallius, ut sua omnia aliis tribui facile permiserit, quæque feliciter invenit, intra scrinia sua latere, quam in lucem prodire maluerit; quî tandem factum est, ut hæc ab eo sumere poterit Gregorius? Videamus quibus argumentis tectus Galloysius hanc criminationem denuo urgere pergat. *Primo, inquit, methodum hanc de transformatione curvarum a Robervallio excogitatam in Italia ante annum 1668 notam esse constat, quia Torrecellius qui mortuus est An. 1647 in Epistolis suis testatur eam sibi a Robervallio communicatam esse. 2do. Hanc methodum cum Gregoriana eandem esse invitus fatetur adversarius. 3tio. Itaque verisimile admodum videri debet, quod Gregorius dum in Italia peregrina-*

(n) *Journales des Savans An. 1668.* (o) *Oeuvres des Mathém. par M. de l'Acad. Roy.*

retur, hanc methodum tam diu in Italia cognitam ab Italis habuerit.

Quod Methodus hæc, quæ sub Robervallii nomine prodit An. 1692, eadem sit cum illa quam Prop. XI. Math. Univers. jam ante annos viginti quatuor ediderat Gregorius, sicuti utramque inspicienti satis clarum est, ita a me ultro concessum fuit. Dixi quidem eam in Gallorum scriptis, ubi Robervallio tribuitur, demonstratione miserâ & pudendâ vestitam, sed non eandem esse cum Gregoriana nunquam disputavi, nullam ex hac parte litem movi, utcunque in ea præcipuam inter nos quæstionem versari dicat Galloysius, meque super eâ manus dedisse serio triumphet. Nondum tamen illi concedo eam vel Italis ante notam esse, vel ab iis Gregorio impertitam. Quomodo enim liquet iis fuisse notam? Quia eam Robervallius cum Torricellio communicavit. Unde vero hoc constat? Ex Epistola ipsius Torricellii. Ubi est hæc Epistola? Apud Galloysium. Quando scripta est? Annis abhinc fere sexaginta. Ubi tam diu latuit? Ubi omnia mirabilia latent, in ipsis Robervallii apothecis. An hæc Epistola genuina sit, multo minus an omnino sit, in tanta testimoniorum luce nefas est dubitare. Sed ex quibus literarum monumentis evincitur Torricellium hæc inventa Italis impertitum esse? De hoc altum est adhuc silentium. Vel si cui hæc forte impertiit, poterant tamen iterum excidisse, & penitus fuisse ignota, cum ipse Torricellius viginti jam annis ante Gregorij in Italiam adventum mortuus fuerit. Aut si nondum memoriâ hominum exciderant, dicat si potest Galloysius quis Mathematicorum hæc arcana sibi a Torricellio commissa Gregorio ostenderit. Dicet fortasse (quid enim pro arbitrio suo non dicet) in Italia multis nota esse. An vero Itali Arcana hæc Geometrica quæ per viginti annos nusquam prodire, Gregorio demum peregrino crederent? An ille in media Italia (Liber enim ejus Patavij impressus est) ausus esset pro suis venditare quæ modo ab Italis didicerat? Vel si fuisset adeo ex-

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pers verecundiæ, hocine fieri potuit, ipsis non modo non reclamantibus, sed etiam plaudentibus Italis. Mihi quidem hoc non fit verisimile. Sed judicent, quibus hæc omnia permitto, eruditi, & ignoscant mihi si hæc prolixius prosecutus sim, ut finem aliquando imponam huic tam jejunæ disputationi, unde nullum ad Literatos fructum redundare speramus. Stemus vero, si Galloyssio placeat, ipsius Robervallij judicio; Ipso enim arbitro hujusce methodi Author habendus est Gregorius. Robervallius enim dum *Cavallerij Indivisibilia* a se inventa integro ante quinquennio jactitat, *Cavallerio* interim Authoris laudem relinquit. Ego, inquit, *tanto viro tantæ & tam sublimis doctrinæ inventionem non eripiam; nec possum, nec si possem, faciam.* Ille prior vulgavit, ille hoc jure suam fecit: ille hoc jure habeat, atque possideat: ille tandem hoc jure *Inventoris nomine* gaudeat. Absit ut in tali causa *Intercessoris* ridiculi provinciam mihi suscipiam. Suscepit tamen Galloyssius. Ac profecto si pergat Illustis illius Academici scrinia excutere, & inventa, quæ ibi per tot annos dormierunt, expergifacere, atque in lucem protrahere, nescio quousque posthuma crescet laude Robervallius: aut quid novi ultra nostri ævi Mathematicis reliquum sit, quod non pari jure, ac hæc Gregoriana, Robervallio demum arrogari possit.

V. *An Account of a Storm of Rain that fell at Denbigh in Wales: Communicated to Dr Hans Sloane, R. S. Secr.*

UPON *Tuesday*, the 16th day of *July* 1706, about eight a clock in the Morning, it began to rain in and about *Denbigh*, which continued incessantly for 30 hours, but not very violently, till about three or four a Clock in the Morning upon *Wednesday*, when it rain'd somewhat faster, attended with a terrible noise (like Thunder) with some flashes of Lightning, and a boisterous Wind. About break of day the Rain and Wind began to abate of their violence, which lessen'd gradually every hour, till about one or two a clock in the afternoon, and then it perfectly ceased, and the Air became clear and somewhat calm.

Upon *Tuesday* the Wind blew South West, but on *Wednesday* it was come to the North West.

The effects of this great Storm were dismal, for it occasioned the overflowing of all the Rivers in *Denbighshire*, *Flintshire* and *Merionethshire*, &c. which spoiled a great deal of Corn, and took off all the Hay that was mowed, near the Banks of the Rivers, which was carried by the Stream in such vast Quantities down to the Bridges, that it choakt the Arches and Inlets, insomuch that it broke down above a dozen great Bridges, the rebuilding of which in the three Counties above-mentioned is valued at some thousands of pounds. Great Oaks and other

other large Trees were unrooted and swept away, with several Quickset Hedges; and some Quillets by the side of the River *Elwy* so cover'd with Stones and Gravel, that the Owners can't well tell whereabouts their Hedges and Landmarks stood; and the same River has alter'd its course in some places, so as to rob the Landlords on one side of some Acres, and bestowed as much on the opposite side. Two or three Rivulets, that convey'd Water to some Mills, have been so choakt up with Stones and Gravel, that the Owners don't think the Profit will counter-vail the great charge of clearing them.

It is affirmed by a great many people, that the great Floods were not so much the effects of the Rain, as the breaking out of an infinite number of Springs, in such places, as they were never known to flow from before. In the Town of *Denbigh* a great many broke out in the Houses and Stables, especially in that part which lies next the Castle on the North side of it; some of which broke out with a great deal of violence, and in such a quantity, that it is affirmed by several men of the Town, that three of these new Springs, which flowed out of the Stables of the three noted Inns, *viz.* the *Bull*, *Cross Keys*, and *Boars Head*, were sufficient to turn any Corn Mill.

At a small distance, Northward of *Denbigh*, lies *Park-Snodiog*, a Rocky Hill, out of which broke out a great many Springs, which flowed so plentifully for nine or ten days, that the Cattel water'd in them for that time; whereas before and after, the people were forc'd to Water them all Summer long at a Well in the High-way, at some distance from this *Park-Snodiog*. There are several deep Holes and Trenches cut in the High-ways adjoining to the River *Elwy*, &c. some so very large, as to hide 3 or 4 Horses, which is not attributed so much to the overflowing of the River, as to the breaking out of Springs in those very places.

In *Comb Mountain* there is a Pit of a circular form, which in the Summer time used to have little or no Water in it, and in Winter, as much Water as would swell the surface to about fourteen or sixteen yards cross over: But now in the midst of Summer it rose up at least a yard and a half higher than it was ever known to do in the wettest Winters; and overflowing its Banks, it fell down the Hill with such violence, as to penetrate into the very body of a Rocky Road, and dug Pits in it, that will bury the biggest Horses, and the Road, which was a common Highway, is now become irreparable.

VI. *An Observation of a Tumor on the Neck, full of Hydatides, cured by Mr Anthony Hewnden, Surgeon: Communicated by Dr Edw. Tyson, F.R.S.*

A Gentlewoman in *London*, aged 25 years, had a large Wenny Tumor, the *Basis* taking its Origin from all the lower hinder part of the Skull, stretching down the Neck near each Jugular, extending it self almost as low as both *Scapula's*; on the upper part was a *Phlegmon*. The *Radix* being so large, I put on a transverse Caustick the length and breadth of the Tumor, intending to separate the *Cutis* from the Membrane of the *Cistis*; but it being so thin where the *Phlegmon* was, oblig'd me to divide the *Cistis*; out of which I sav'd above threescore *Hydatides*, of the bigness of a small Wallnut: Several more were broken. These *Hydatides* swum in a Liquor of the consistence of Whites of Eggs. In this *Cistis* I found a large quantity of *Atheromatous* and *Steatomatous* Matter, at the *Basis* a large *Sarcoma*; the greatest part I cut off, but fearing to hurt the Muscles of the Neck, deferr'd it to the next dressing.

intending to take the rest of the *Sarcoma*, and *Radix* of the *Cistis* away by Caustical Medicines, which I applied without success, they coming off without making an Eschar, the *Radix* being of a Cartilagenous substance : searching with my Probe to find some Interstice, it dropt into one ; and touching some Membranous or Nervous Body, caus'd the Patient to cry out furiously ; into which Interstice I put a piece of Roman Vitriol fitted for the place, which came out the next day all dissolved with some of the *Radix* : By the continual applying of the Vitriol, I extirpated the whole *Radix*, and healed the whole *S. A.*

Two Observations belong to this worthy of knowing : The one is, Seven years before this Operation, this *Tumor* was very near so big, and subsided of itself.

The other is, when I began with Caustical Medicines, the first I used was *Præcip. rub.* which I cover'd the whole *Radix* with, which came off and no Eschar, but it salivated the Patient for 5 weeks.

VII. *Part of a Letter from Mr Robert Taylor to Dr Hans Sloane, R. S. Secr. concerning a Monstrous Birth.*

Hitchin, April 4. 1706.

LAST week a Woman in a Neighbouring Village being in Strong Labour, the Midwife finding the Birth coming very awkwardly, and more Legs than usual, after a tedious time, delivered the poor Woman of Twins (designed by Nature doubtless) but joyned together ; there being but one Trunk of a Body with two Necks, on each a Head, four Arms, two forwards and two backwards,

wards, those backwards crossing each others Shoulder, like two persons side to side : There is but one Navel, two Matrix's, two Fundaments, two pair of Hips, four Legs : They had gone the full time, having Hair on their Heads, and Nails on their Fingers and Toes. The Mid-wife tells me they were alive within less than half an hour before Delivered : They look very clear and well. The Children are near ** inches long, and by reason of their being joyned, are about 7 inches over.

VIII. *An Account of Dr Ehm's Treatise of St George's Bath by Landeck, in the Lordship of Glats near Silesia.*

P. 8. **H**E gives an account of this Water, that it fills a Basin of 21 Foot long, 10 broad, and 5 foot deep, every 4 hours.

10. The Smell is a little sulphureous, especially at a distance. The Taste a little sulphureous and saline, but not at all subacid.

11. The Heat is but temperate in Summer, in Winter much greater.

There was Gall in Powder put to the Water, but it did not turn black.

14. *Ol. Tartar. p. Deliquium, Spiritus Salis Armoniaci,* and many Mineral Acid Spirits mixt with it, made no Alteration ; nor did the Solution of fine Silver in *Aq. fort.* make any Change or Precipitation.

17. The Bath-Water is conveyed into a Copper, where it is made to seeth by Artificial Heat, and is afterwards brought into the common Baths to encrease the Heat as the particular Cases require.

2. He ascribes much virtue to a sort of earthy factitious matter contain'd in the Water. (At this I much wonder, for he seems only to describe a Clay or sort of Fullers Earth, that holds very little Medical Virtue.)

He supposes also a Sulphur and Nitre to be conceal'd in the Water, (but it does not appear in his *Examen Chymicum*) by which Ulcers are heal'd, Coagulations are dissolv'd, relax'd Nerves are strengthened, Scabs and Leprous Affections cured, &c.

The following Chapters give a more particular account of the several Distempers for which these Bathings are used ; as also Cautions in what Cases to forbear the use of Bathing.

The warmth of these Waters seems not to exceed the tepid Heat of *Bristol* Well.

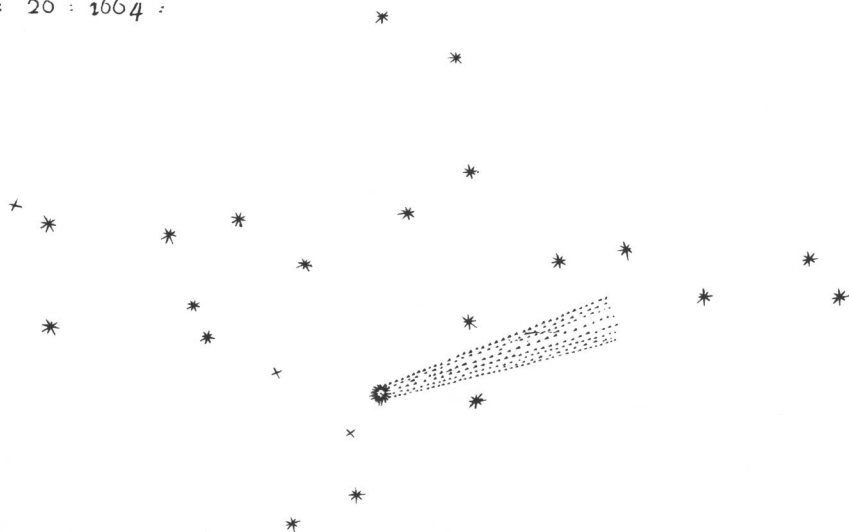
It seems strange that they have not Courage enough to try the virtue of these Waters internally ; especially since the Contents of these Waters are very few, if any, that are gross or fixt : The Taste is scarce differing from pure Limpid Water ; and what is more strange, in his Experiment with the Solution of Silver, he says, they discover'd no precipitation or perturbation of the Waters, whereas we know scarce any Water (except Rain Water) that does not suffer a Change by this Solution, when mixt with it.

L O N D O N : Printed for *Sam. Smith* and *Benj. Walford*, Printers to the Royal Society, at the *Prince's Arms* in *St Paul's Church-yard*.

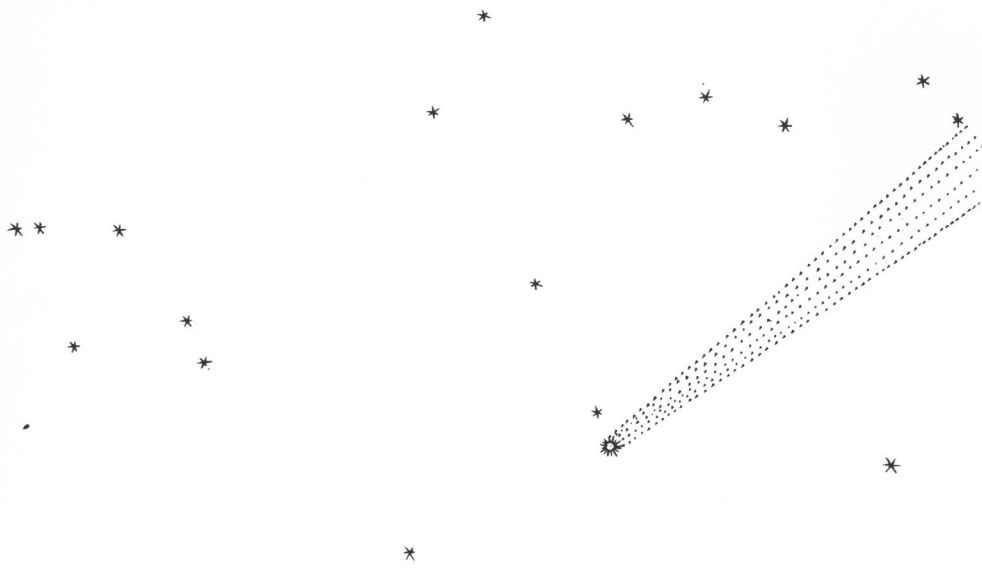
ERRATA.

Philos. Transact. Numb. 305. pag. 2211. line 9. for *small* read *was*. p. 2213. l. 11. after the Word *Ground* add *above*. p. 2214. l. 7. after the word *End* add *and*. Philos. Transact. Numb. 306. p. 2225. l. 6. for *John 1. Thomas* item p. 2226. l. 3. for *John 1. Thomas*.

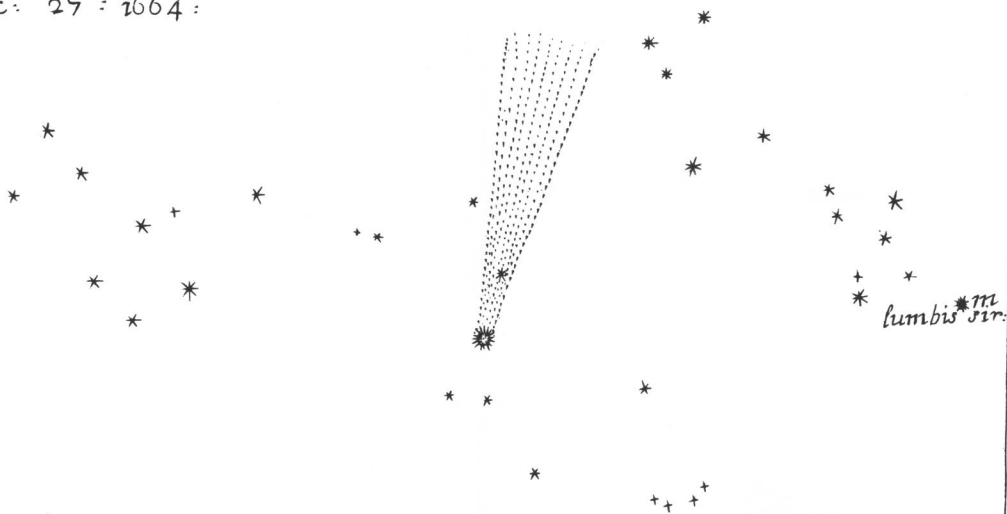
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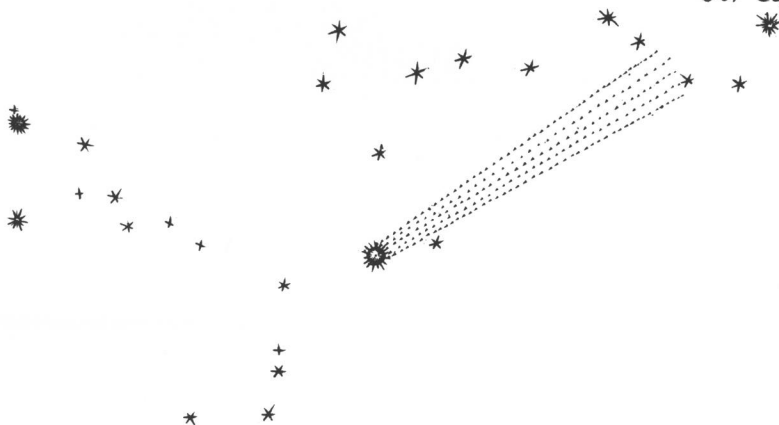


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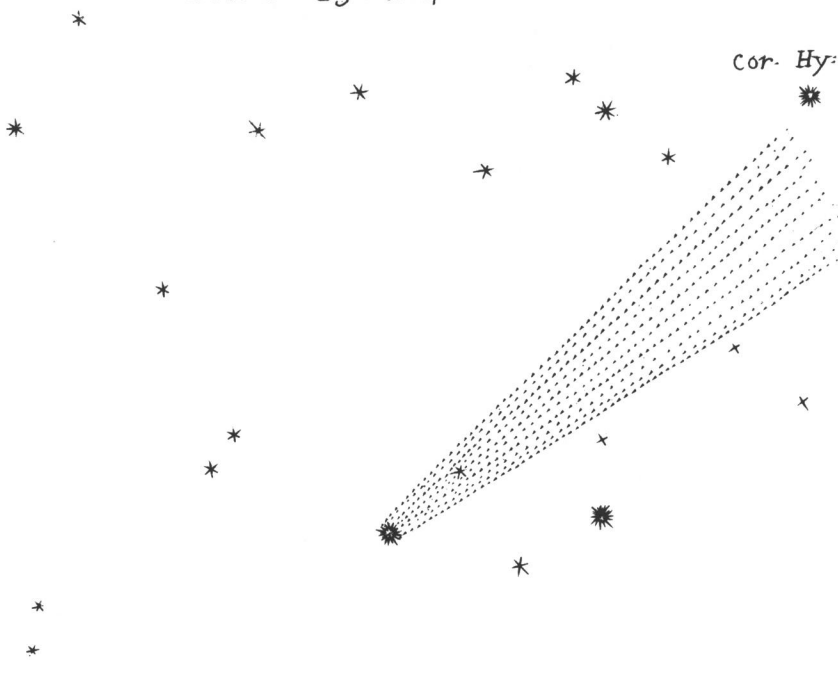
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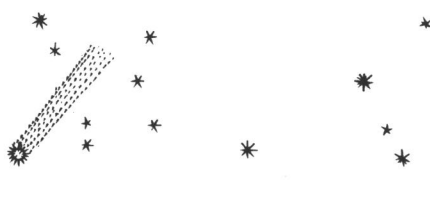
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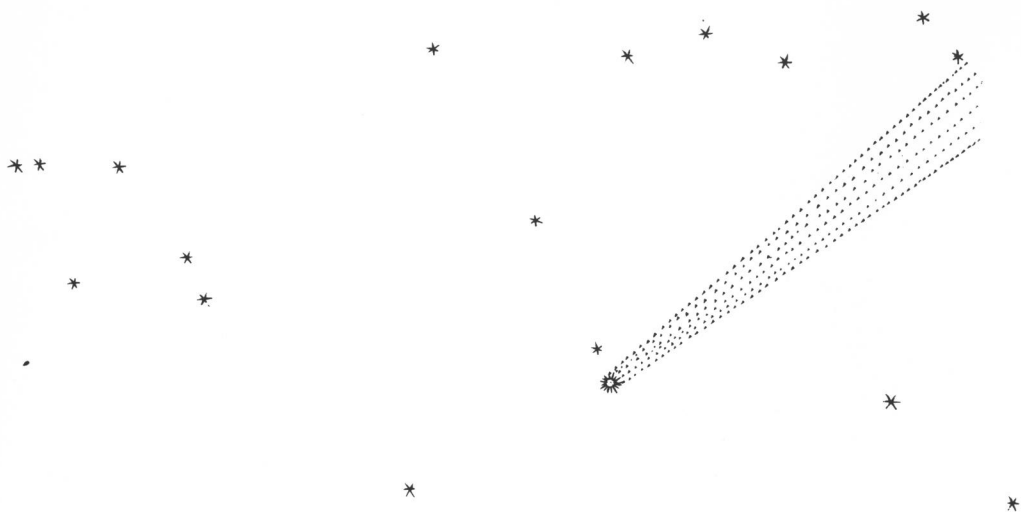
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Sirius

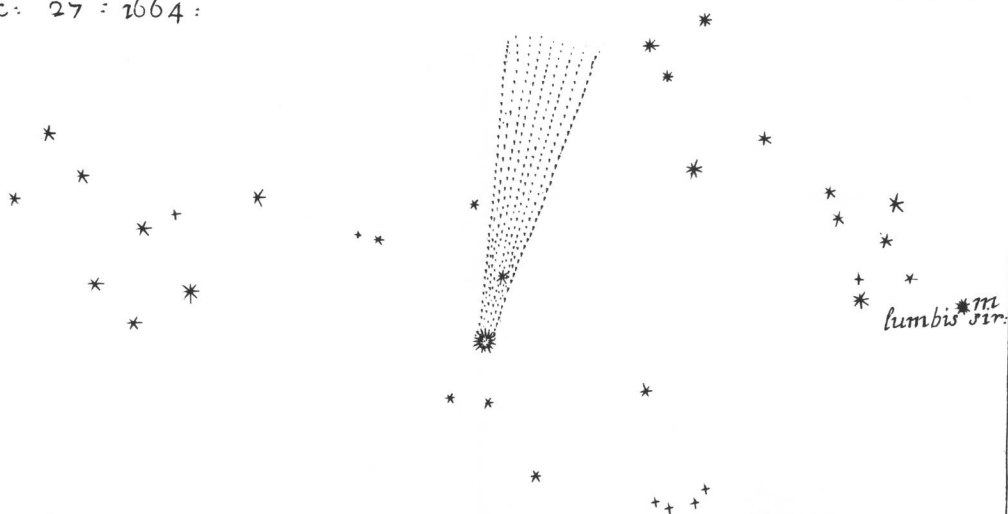


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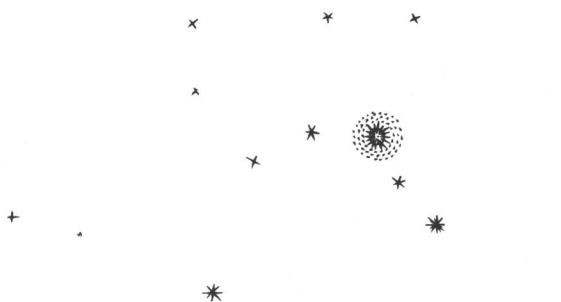


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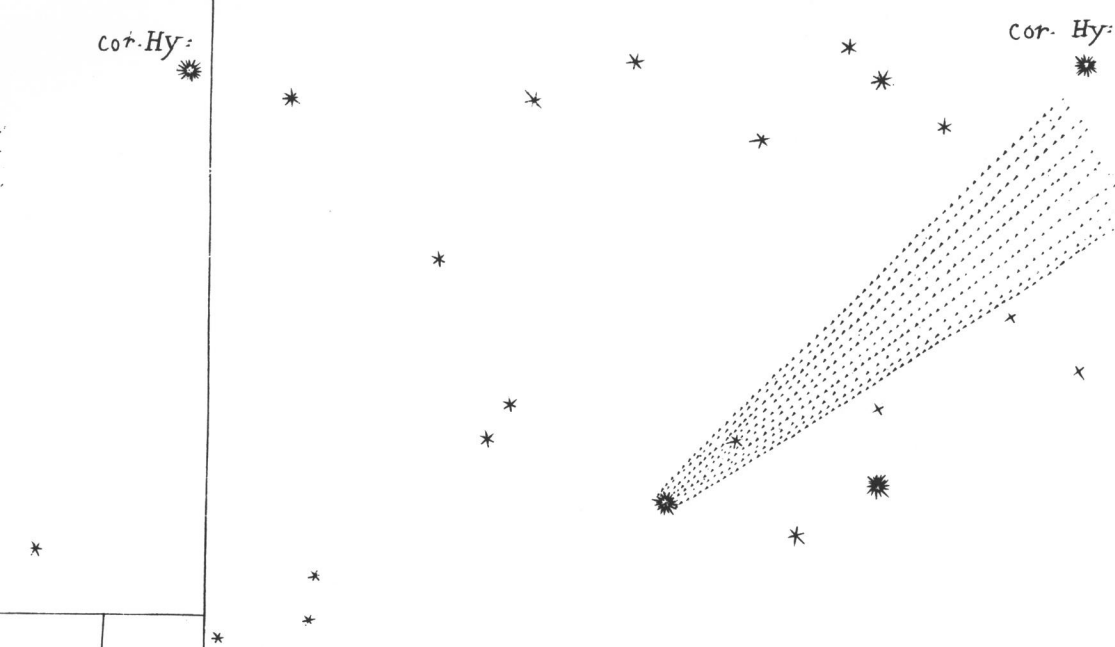
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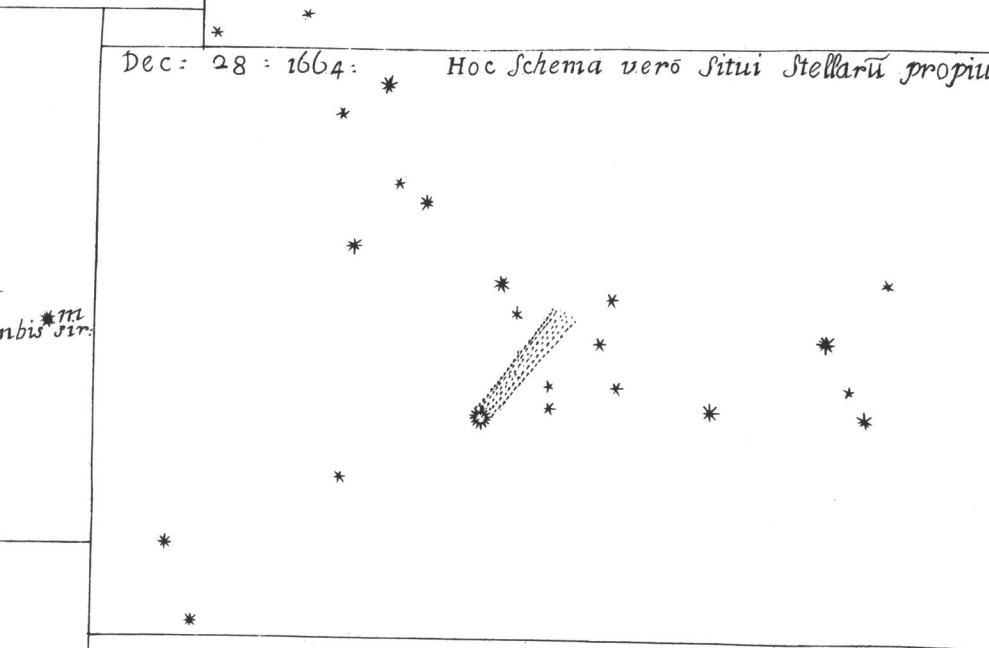


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PHILOSOPHICAL TRANSACTIONS.

For the Months of January, February, and March, 1707.

The CONTENTS.

- I. *Observations made at Rome, by the late Reverend Mr. John Ray, of the Comet which appeared Anno 1664. Communicated to the Publisher by Mr. Samuel Dale.*
- II. *Æquationum Cubicarum & Biquadraticarum, tum Analytica, tum Geometrica & Mechanica, Resolutio Universalis, à J. Colson.*
- III. *Æquationum quarundam Potestatis tertiæ, quintæ, septimæ, nonæ, & superiorum, ad infinitum usque per-
gendo, in terminis finitis, ad instar Regularum pro
Cubicis quæ vocantur Cardani, Resolutio Analytica.
Per Abr. De Moivre, R. S. S.*
- IV. *Several Experiments shewing the strange Effects of the
Effluvia of Glafs, producible on the Motion and Attrition
of it. By Mr. Fr. Hauksbee, F. R. S.*
- V. *Tabula exhibens Cæli tempestates, & mutationes, ter
unoquoque die : Item Plagam Ventorum, & Nubium ;
Altitudinem Mercurii in Barometro, & Spirituum in Ther-
mometro ; & denique Pluviæ quantitatem, quæ quibus-
dam diebus, & unoquoque Mense, per Infundibulum
12 pollices latum, apud Upminster in Comitatu Essexiæ
decidebat Anno 1705. Per W. Derham Rectorem Upmin-
sterensem, & S. R. S.*
- VI. *An Account of Balls of Hair taken from the Uterus and
Ovaria of several Women ; by Mr. James Yoneg, F.R.S.
Communicated to Dr. Hans Sloane, R. S. Secr.*

I. *Observations made at Rome, by the late Reverend Mr. John Ray, of the Comet which appeared Anno 1664. Communicated to the Publisher by Mr. Samuel Dale.*

December the 20th 1664, S. N.

ABout three of the Clock this Morning, I observed the *Comet* ; it was in the Constellation of *Hydra*, not far from the Foot of *Crater*. It appeared about the bigness of a Star of the first Magnitude, but nothing so lucid and bright. It had a very long Tail, which pointed almost directly towards the Heart of *Hydra* : The Tail shew'd somewhat like Rays of a Candle burning in a Mist : The Figure of it was Conical ; the Length of it 5 or 6 Degrees ; the Breadth at the Base not above a Degree and half. The Body of this *Comet* was about 3 Degrees to the South-East of the most Southerly Star in the foot of *Crater* ; it stood very near in a Right Line with the two lowermost Stars in the Foot of *Crater*, which are common to it and *Hydra*. See the *Figures*.

December 21. In the Morning, about the same Hour, it was removed about a Degree and half from the Place where it stood, Westward, and a little to the South. The
Tail

Tail pointed still towards the Heart of *Hydra*, and appeared 10 Degrees long at the least.

December 22. At the same time it was removed from the Place where it stood the Day before, to the same Point, and about the same distance as the Night before. The Tail of it still pointed to *Cor Hydrae*, or a little thought above it, as the two former Days, and was rather longer than shorter : It also, to my thinking, appeared brighter and larger ; the Body of it being bigger then any Fixt Star, except *Sirius*.

December 23. It was removed to the same Point, and about the same Distance as the Day before ; the Tail of it was as long as ever, and the *Comet* brighter. The Tail pointed almost directly to *Cor Hydrae*.

December 24, 25, 26. All these 3 Nights were Cloudy, so that I could make no Observations.

December 27. We found it strangely removed from the Place where it was : It was still Westward, and a little to the South, as before. The Body of the Star was still brighter, and the *Cauda* about it greater, and more bushy, and yet as long as before ; it pointed almost directly against *Canis major*. The Body of it was among the Stars of *Argo*.

December 28. The same time it was removed above 2 Degrees towards the same Point, and come within 4 or 5 Degrees of the most Eastern Stars in the bright Triangle in the Buttocks of *Canis major*. The Moon shining we could not so well judge, either of the Bigness of the Body, or the length and Bushiness of the Tail.

December

December 29. It was strangely removed, and got before, not the Eastern Star only of the mentioned bright *Triangle*, but also the most Northern. I think, at least, in this last 24 Hours, it had moved 4 Degrees. The *Moon* shining bright, the Tail could not well be observed, yet still it seemed to point directly to *Canis minor*.

II. *Æquationum*

II. *Æquationum Cubicarum & Biquadraticarum, tum Analytica, tum Geometrica & Mechanica, Resolutio Universalis, a J. Colson.*

$$\S. I. \text{Æquationis Cubicæ } \left\{ \begin{array}{l} x^3 = 3 p x^2 + 3 q x + 2 r, \\ \text{Universalis} \quad \quad \quad - 3 p^2 + p^3 \\ \quad \quad \quad \quad \quad - 3 p q \end{array} \right.$$

Radices Tres sunt,

$$x = p + \sqrt[3]{r + \sqrt{r^2 - q^3}} + \sqrt[3]{r - \sqrt{r^2 - q^3}}$$

$$x = p - \frac{1 - \sqrt{-3}}{2} \times \sqrt[3]{r + \sqrt{r^2 - q^3}} - \frac{1 + \sqrt{-3}}{2} \times \sqrt[3]{r - \sqrt{r^2 - q^3}}$$

$$x = p - \frac{1 + \sqrt{-3}}{2} \times \sqrt[3]{r + \sqrt{r^2 - q^3}} - \frac{1 - \sqrt{-3}}{2} \times \sqrt[3]{r - \sqrt{r^2 - q^3}}$$

Vel ut Calculus Arithmeticus facilior ac paratior evadat, si posueris Binomii irrationalis $r + \sqrt{r^2 - q^3}$ Radicem Cubicam esse $m + \sqrt{n}$, erunt ejusdem *Æquationis* Radices tres $x = p + 2 m$, & $x = p - m \pm \sqrt{-3 n}$.

Igitur data *Æquatione* quavis Cubica, inter ejus hujusque *Æquationis* Universalis terminos singulos instituenda est comparatio, quo pacto facillime inveniuntur ipsæ p , q , r ; & hisce cognitis, innotescunt *Æquationis* datæ Radices omnes. Hujus vero Solutionis Exempla sint sequentia in Numeris.

I. *Æquationis* Cubicæ $x^3 = 2 x^2 + 3 x + 4$ sit Radix x indaganda. Erit primò juxta præscriptum $3 p = 2$,
14 N
five

five $p = \frac{2}{3}$. Secundò $3q - (3p^2)\frac{4}{3} = 3$, five $q = \frac{13}{9}$.

Tertiò $2r (+ p^2 - 3q \times p) - \frac{70}{27} = 4$, five $r = \frac{89}{27}$,

& $r^2 - q^3 = \frac{212}{27}$. Et propterea $x = \frac{2}{3} + \sqrt[3]{\frac{89}{27}} + \sqrt{\frac{212}{27}}$

$+ \sqrt[3]{\frac{89}{27}} - \sqrt{\frac{212}{27}}$. Reliquæ duæ Radices sunt impossibiles.

2. In Æquatione $x^3 = 12x^2 - 41x + 42$, erit primò $3p = 12$, five $p = 4$. Secundò $3q - (3p^2)48 = -41$, five $q = \frac{7}{3}$. Tertiò $2r + (p^2 - 3q \times p)36 = 42$,

five $r = 3$; Et inde $r^2 - q^3 = -\frac{100}{27}$. At Binomii furdi

$3 + \sqrt{-\frac{100}{27}} (= r + \sqrt{r^2 - q^3})$ Radix Cubica, per Methodos ex Arithmetica petendas extracta, est $-1 + \sqrt{-\frac{4}{3}} (= m + \sqrt{n})$ & proinde Radix $x = (p + 2m = 4 - 2 =) 2$, vel etiam $x = (p - m + \sqrt{-3n} = 4 + 1 + (\sqrt{4})2 =) 7$ vel 3. Vel rursus, ejusdem Binomii

$3 + \sqrt{-\frac{100}{27}}$. Radix alia Cubica (tres enim agnoscit)

est $\frac{3}{2} + \sqrt{-\frac{1}{12}} (= m + \sqrt{n})$ & proinde Radix $x = (p + 2m = 4 + 3 =) 7$, & etiam $x = (p - m + \sqrt{-3n} = 4 - \frac{3}{2} + (\sqrt{\frac{1}{4}})\frac{1}{2} = 3$ vel 2. Vel denuo,

ejusdem Binomii $3 + \sqrt{-\frac{100}{27}}$ Radix Cubica tertia est

$-\frac{1}{2} - \sqrt{-\frac{25}{12}}$, $(= m + \sqrt{n})$ & proinde Radix

$x =$

(2355)

$x = (p + 2m = 4 - 1 =) 3$, atque etiam $x = (p - m \pm \sqrt{1 - 3n} = 4 + \frac{1}{2} \pm (\sqrt{\frac{25}{4}}) \frac{5}{2} =) 7$ vel 2.

3. In *Æquatione* $x^3 = -15x^2 - 84x + 100$, erit $p = -5$, $q = -3$, $r = 135$; & Binomii $135 + \sqrt{18252}$ Radix Cubica est $3 + \sqrt{12}$. Igitur Radix $x = -5 + 6 = 1$, & $x = -5 - 3 \pm \sqrt{-36} = -8 \pm \sqrt{-36}$, impossibiles.

4. In *Æquatione* $x^3 = 34x^2 - 310x + 1012$, erit $p = \frac{34}{3}$, $q = \frac{226}{9}$, $r = \frac{5536}{27}$; & Binomii $\frac{5536}{27} + \sqrt{\frac{707560}{27}}$ Radix Cubica est $\frac{16}{3} + \sqrt{\frac{10}{3}}$. Igitur Radix $x = \frac{34}{3} + \frac{32}{3} = 22$, & $x = \frac{34}{3} - \frac{16}{3} \pm \sqrt{-10} = 6 \pm \sqrt{-10}$, impossibiles.

5. In *Æquatione* $x^3 = 28x^2 + 61x - 4048$, erit $p = \frac{28}{3}$, $q = \frac{967}{9}$, $r = -\frac{25010}{27}$; & Binomii $-\frac{25010}{27} + \sqrt{-382347}$ Radix Cubica est $\frac{41}{6} + \sqrt{-\frac{243}{4}}$. Igitur $x = \frac{28}{3} + \frac{41}{3} = 23$, & $x = \frac{28}{3} - \frac{41}{6} \pm (\sqrt{\frac{729}{4}}) \frac{27}{2} = 16$ vel -11 .

6. In *Æquatione* $x^3 = -x^2 + 166x - 660$, erit $p = -\frac{1}{3}$, $q = \frac{499}{9}$, $r = -\frac{9658}{27}$; & Binomii $-\frac{9658}{27} + \sqrt{-\frac{1147205}{27}}$ Radix Cubica est $-\frac{22}{3} + \sqrt{-\frac{5}{3}}$. Igitur $x = -\frac{1}{3} - \frac{44}{3} = -15$, & $x = -\frac{1}{3} + \frac{22}{3} \pm \sqrt{5} = 7 \pm \sqrt{5}$, irrationales.

7. In

(2356)

7. In *Æquatione* $x^3 = 63 x^2 + 99673 x + 9951705$,
erit $p = 21$, $q = \frac{100996}{3}$, $r = 6031680$; & Binomii
 $6031680 + \sqrt{\frac{47887175043136}{27}}$ Radix Cubica est

$183 + \sqrt{\frac{529}{3}}$. Igitur $x = 21 + 366 = 387$, &
 $x = 21 - 183 \pm (\sqrt{529}) 23 = -139$ vel 185 .

Nec fecus in cæteris procedendum: Investigatur autem
Theorema ad modum sequentem. Pono *Æquationis* cu-
jusdam Cubicæ Radicem $z = a + b$, & cubicè multi-
plicando proveniet $z^3 = (a^3 + 3 a^2 b + 3 a b^2 + b^3 =)$
 $a^3 + 3 a b \times a + b + b^3$. Jam loco ipsius $a + b$ valo-
rem ejus z substituendo, fiet $z^3 = 3 a b z + a^3 + b^3$, quæ
est *Æquatio Cubica ex Radice* $z = a + b$ constructa, cui
terminus secundus deest. Ut hæc verò ad formam magis
commodam magisq; concinnam revocenter, sumo *Æqua-*
tionem $z^3 = 3 q z + 2 r$, quæ posthac ipsius $z^3 = 3 a b z$
 $+ a^3 + b^3$ vices gerat. Igitur transmutatione hujus in
illam, fiet primò $3 q = 3 a b$, five $q_3 = a^3 b^3$; & se-
cundò $2 r = a^3 + b^3$, five $2 r a^3 = (a^6 + a^3 b^3 =) a^6 + q_3$.
Et soluta hac *æquatione quadratica*, erit $a^3 = r + \sqrt{r^2 - q_3}$,
& hinc $b^3 = (2 r - a^3 =) r - \sqrt{r^2 - q_3}$: Atque igi-

tur tandem $a = \sqrt[3]{r + \sqrt{r^2 - q_3}}$ & $b = \sqrt[3]{r - \sqrt{r^2 - q_3}}$.
Et propterea in *Æquatione Cubica* $z^3 = 3 q z + 2 r$ erit

Radix $z = (a + b =) \sqrt[3]{r + \sqrt{r^2 - q_3}} + \sqrt[3]{r - \sqrt{r^2 - q_3}}$

At verò hæc Radix reverà triplex est, pro triplici va-
lore quem induere potest & $\sqrt[3]{r + \sqrt{r^2 - q_3}}$ &

$\sqrt[3]{r - \sqrt{r^2 - q_3}}$. Cujusvis enim quantitatis Radix Cu-
bica triplex erit, & ipsius Unitatis Radix Cubica vel
est

est 1, vel $-\frac{1}{2} + \frac{1}{2}\sqrt{-3}$, vel $-\frac{1}{2} - \frac{1}{2}\sqrt{-3}$:

Atque id adeo, propterea quòd harum alicujus Cubus fit

Unitas. Igitur si $1 \times \sqrt[3]{r + \sqrt{r^2 - q^3}}$ aut $\sqrt[3]{r + \sqrt{r^2 - q^3}}$

($= \sqrt[3]{1 \times r + \sqrt{r^2 - q^3}} = \sqrt[3]{1 \times \sqrt[3]{r + \sqrt{r^2 - q^3}}}$) Ra-

dicem aliquam [quam supra nominavimus $m + \sqrt{n}$, aut

$1 \times m + \sqrt{n}$,] Cubi $r + \sqrt{r^2 - q^3}$ designet; ipse

$\frac{-1 + \sqrt{-3}}{2} \times \sqrt[3]{r + \sqrt{r^2 - q^3}}$ & $\frac{-1 - \sqrt{-3}}{2}$

$\times \sqrt[3]{r + \sqrt{r^2 - q^3}}$ [i. e. $\frac{-1 + \sqrt{-3}}{2} \times m + \sqrt{n}$ &

$\frac{-1 - \sqrt{-3}}{2} \times m + \sqrt{n}$] alias duas ejusdem Cubi Ra-

dices designabunt. Similiter & $\sqrt[3]{r - \sqrt{r^2 - q^3}}$,

$\frac{-1 + \sqrt{-3}}{2} \times \sqrt[3]{r - \sqrt{r^2 - q^3}}$, & $\frac{-1 - \sqrt{-3}}{2}$

$\times \sqrt[3]{r - \sqrt{r^2 - q^3}}$, [i. e. $m - \sqrt{n}$, $\frac{-1 + \sqrt{-3}}{2}$

$\times m - \sqrt{n}$, $\frac{-1 - \sqrt{-3}}{2} \times m - \sqrt{n}$] tres Cubica Ra-

dices erunt Apotomes $r - \sqrt{r^2 - q^3}$. Atque has Radices

debitè connecendo, fiet $z = \sqrt[3]{r + \sqrt{r^2 - q^3}}$

$+ \sqrt[3]{r - \sqrt{r^2 - q^3}}$, [i. e. $z = m + \sqrt{n} + m - \sqrt{n} = 2m$,]

$z = \frac{-1 + \sqrt{-3}}{2} \times \sqrt[3]{r + \sqrt{r^2 - q^3}} + \frac{-1 - \sqrt{-3}}{2}$

$\times \sqrt[3]{r - \sqrt{r^2 - q^3}}$, [i. e. $z = \frac{-1 + \sqrt{-3}}{2} \times m + \sqrt{n}$

$+ \frac{-1 - \sqrt{-3}}{2} \times m - \sqrt{n} = -m + \sqrt{-3}n$,] & $z =$

$\frac{-1 - \sqrt{-3}}{2} \times \sqrt[3]{r + \sqrt{r^2 - q^3}} + \frac{-1 + \sqrt{-3}}{2} \times \sqrt[3]{r - \sqrt{r^2 - q^3}}$

$$[i. e. z = \frac{-1 - \sqrt{-3}}{2} \cdot m + \sqrt{n} + \frac{-1 + \sqrt{-3}}{2} \cdot n]$$

quæ tres erunt Radices $\text{\AA}quationis$ Cubicæ $z^3 = 3 q z + 2 r$. Debitæ autem connectuntur Radices istæ ad modum præcedentem, quippe quæ sic connexæ, & more vulgari in se invicem continue ductæ, $\text{\AA}quationem$ $z^3 = 3 q z + 2 r$ restituant. Denique fac $z = x - p$, & $\text{\AA}quatio$ fiet $x^3 - 3 p x^2 + 3 p^2 x - p^3 = 3 q x - 3 p q + 2 r$, quæ universalis est, & cujus Radices evadunt ut supra fuerunt exhibitæ.

Hic obiter notatu dignum est, quod $\text{\AA}quationis$ Cubicæ cujuscunque Radices omnes sint possibiles & reales, quoties Binomii membrum irrationale $\sqrt{r^2 - q^3}$ impossibilitatem in se complectitur; hoc est, quoties q est quantitas affirmativa, & simul cubus ejus major est quadrato ex latere r . At si membrum istud $\sqrt{r^2 - q^3}$ sit possibile, hoc est si q sit quantitas negativa, aut etiam si affirmativæ cubus sit minor quadrato ex latere r , tunc unicam tantum agnoscit $\text{\AA}quatio$ Radicem possibilem & realem, reliquæque duæ erunt impossibiles.

In hoc Theoremate si fiat $p = 0$, hoc est, si desit $\text{\AA}quationis$ terminus secundus, tunc deventum erit ad casum Regularum quæ dicuntur *Cardani*, cujus solutio continetur in præcedentibus.

§. 2. $\text{\AA}quationis$ Biquadraticæ Universalis

$$x^4 = 4 p x^3 + 2 q x^2 + 8 r x + 4s, \\ - 4 p^2 - 4 p q - q^2$$

$$\text{Radices quatuor sunt } x = p - a \pm \sqrt{p^2 + q - a^2} - \frac{2r}{a},$$

$$\& x = p + a \pm \sqrt{p^2 + q - a^2} + \frac{2r}{a}, \text{ Ubi } a^2 \text{ est Radix}$$

$$\text{\AA}quationis Cubicæ } a^6 = p^2 a^4 - 2 p r a^2 + r^2 \\ + q - s$$

Jam data $\text{\AA}quatione$ quavis Biquadraticæ, inter ejus cujusque $\text{\AA}quationis$ Universalis terminos singulos instituenda

enda est comparatio, quo pacto citissime inveniuntur ipsæ p, q, r, s ; & hisce cognitis, non latebit valor ipsius a , ex Theoremate superiori inveniendus, & tum demum innotescant *Æquationis* datæ Radices omnes.

Huic Solutioni illustrandæ Exemplum unum aut alterum sufficiat.

1. *Æquationis* Biquadraticæ $x^4 = 8x^3 + 83x^2 - 162x - 936$ sint Radices extrahendæ. Erit primò juxta præscriptum $4p = 8$, five $p = 2$. Secundò $2q = (4p^2) 16 = 83$, five $q = \frac{99}{2}$. Tertiò $8r = (4pq) 396 = -162$, five $r = \frac{117}{4}$. Quartò $4s = (q^2) \frac{9801}{4} = -936$, five $s = \frac{6057}{16}$. Hinc $p^2 + q = \frac{107}{2}$, $2pr + s = \frac{7929}{16}$, $r^2 = \frac{1368}{19}9$, & proinde $a^6 = \frac{107}{2}a^4 - \frac{7929}{16}a^2 + \frac{1368}{16}9$. Jam ut *Æquatio* hæc aliquatenus Cubica in Radices ejus resolvatur, ad Theorema præcedens recurrendum est, in quo erit $p = \frac{107}{2}$, $q = \frac{22009}{144}$, $r = \frac{2903923}{1728}$ & $r^2 - q^3 = -\frac{11940075}{16}$. Atqui Binomii $\frac{2903923}{1728} + \sqrt{-\frac{11940075}{16}}$ Radix Cubica est $-\frac{53}{12} + \sqrt{-\frac{400}{3}}$ & propterea $a^2 = \frac{107}{6} - \frac{53}{6} = 9$, & etiam $a^2 = \frac{107}{6} + \frac{53}{6} \pm (\sqrt{400}) 20 = \frac{169}{4}$ vel $\frac{2}{4}$; Vel quod perinde est, *Æquationis* præmissæ reverà Cubo-Cubicæ sex Radices sunt $a = \pm 3$, $a = \pm \frac{13}{2}$, & $a = \pm \frac{3}{2}$, quarum quævis indiscriminatim proposito

(2360)

fito nostro faciet satis. Puta si in præsentī casu fiat $a = 3$, erit juxta Theorema $x = (p - a +$

$$\sqrt{p^2 + q - a^2 - \frac{2r}{a}} = 2 - 3 \pm \sqrt{4 + \frac{99}{2} - 9 - \frac{39}{2}}$$

$$= -1 + (\sqrt{25}) 5 = 4 \text{ vel } -6, \text{ \& } x = (p + a +$$

$$\sqrt{p^2 + q - a^2 + \frac{2r}{a}} = 2 + 3 \pm \sqrt{4 + \frac{99}{2} - 9 + \frac{39}{2}}$$

$$= 5 + (\sqrt{64}) 8 = 13 \text{ vel } -3, \text{ quæ sunt } \textit{Æquationis}$$

datæ Radices quatuor,

2. In *Æquatione* $x^4 = 20x^3 + 252x^2 - 6592x + 21312$, erit $p = 5$, $q = 176$, $r = -384$, & $s = 13072$. Hinc $p^2 + q = 201$, $2pr + s = 9232$, & $r^2 = 147456$; & inde $a^6 = 201 a^4 - 9232 a^2 + 147456$.

Jam in Theoremate pro Cubicis erit $p = 67$, $q = \frac{4235}{3}$,

& $r = 65219$; eritque Binomii $65219 + \sqrt{\frac{38889307072}{27}}$

Radix Cubica $\frac{77}{2} + \sqrt[3]{\frac{847}{12}}$. Igitur $a^2 = 67 + 77 = 144$,

sive $a = 12$; & proinde $x = 5 - 12 +$
 $\sqrt{25 + 176 - 144 + 64} = -7 \pm (\sqrt{121}) 11 =$
 $4 \text{ vel } -18, \text{ \& } x = 5 + 12 \pm \sqrt{25 + 176 - 144 - 64}$
 $= 17 \pm \sqrt{-7}, \text{ impossibiles.}$

Hujus autem Theorema's Inventio est hujusmodi, Ex
 duarum *Æquationum Quadraticarum* $z^2 + 2az - b = 0$,
 & $z^2 - 2az - c = 0$ in se invicem multiplicatione,

Æquationem conficio Biquadraticam $z^4 = 4 a^2 + b + c$
 $\times z^2 + 2ac - 2ab \times z - bc$, cui terminus secundus deest,
 quamque huc *Æquationi* $z^4 = ez^2 + fz + g$ statuo æqui-
 pollere. Unde primo $4 a^2 + b + c = e$ sive

$b = e - 4a^2 - c$. Secundò $2ac - 2ab = f$, hoc est,

$$2ac - 2ae + 8a^3 + 2ac = f, \text{ sive } c = \frac{f}{4a} + \frac{e}{2} - 2a^2,$$

&

& inde $b = (e - 4a^2 - c) - \frac{f}{4a} + \frac{e}{2} - 2a^2$. Ter-

tiò — $bc = g$, five $-\frac{f^2}{16a^2} + \frac{e^2}{4} - 2ca^2 + 4a^4 = -g$,

hoc est, $a^4 = \frac{1}{2} ea^2 - \frac{1}{4} ga^2 - \frac{1}{16} ca^2 + \frac{f^2}{64}$, quæ

Æquatio quasi Cubica est, ex Radice a^2 & notis vel assumptis e, f, g constata. Ea verò Radix per Theorema superius exhiberi potest, & eodem Calculo innotescant ipsæ b & c . At Æquationum $z^2 + 2az - b = 0$ & $z^2 - 2az - c = 0$ Radices sunt $z = -a \pm \sqrt{a^2 + b}$

& $z = a \pm \sqrt{a^2 + c}$, five $z = -a \pm \sqrt{\frac{1}{2}e - a^2 - 4a^2}$,

& $z = a \pm \sqrt{\frac{1}{2}e - a^2 + \frac{f}{4a}}$, quæ proinde erunt Radices Æquationis $z^4 = ez^2 + fz + g$; cognita videlicet a vel a^2 ex Æquatione $a^6 = \frac{1}{2}ea^4 - \frac{1}{4}ga^2 - \frac{1}{16}ca^2 + \frac{f^2}{64}$. Jam ut

Æquatio ista evadat universalis, & omnibus suis terminis instructa, fac. $z = x - p$, eritque $x^4 - 4px^3 + 6p^2x^2 - 4p^3x + p^4 = ex^2 - 2pex + p^2e + fx - fp + g$,

item & $x = p - a \pm \sqrt{\frac{1}{2}e - a^2 - \frac{f}{4a}}$, & $x = p + a \pm \sqrt{\frac{1}{2}e - a^2 + \frac{f}{4a}}$. Tandem concinnitatis & compendii

gratiâ, fac. $e = 2q + 2p^2$ & $f = 8r$; tum $x^4 - 4px^3 + 4p^2x^2 = 2qx^2 - 4pqx + 2p^2q + p^4 + 8rx - 8pr + g$,

$x = p - a \pm \sqrt{p^2 + q - a^2 - \frac{2r}{a}}$, $x = p + a \pm \sqrt{p^2 + q - a^2 + \frac{2r}{a}}$, & $a^6 = p^2 + q \times a^4 - \frac{1}{4}g + \frac{1}{4}p^4$

$+ \frac{1}{2}p^2q - \frac{1}{4}q^2 \times a^2 + r^2$. Denique fac. $g = 4s - q^2 + 8pr - p^4 - 2p^2q$, & sunt Æquationes præcedentes

$x^4 = 4px^3 + 2qx^2 + 8rx + 4s$ & $a^6 = p^2a^4 - 2pra^2 + r^2$.

$-4p^2 - 4pq - q^2 + q - s$

Scilicet omnia evadunt ut supra sunt posita.

§ 9. Hactenus de *Æquationum Cubicarum & Biquadraticarum Resolutione Analytica*. Quoniam autem earundem *Effectio Geometrica* per Parabolam vulgò tradi solet, & nonnullis in pretio est, ipsam συνηθισμένην, & quidem universalius, non pigebit hic exhibere.

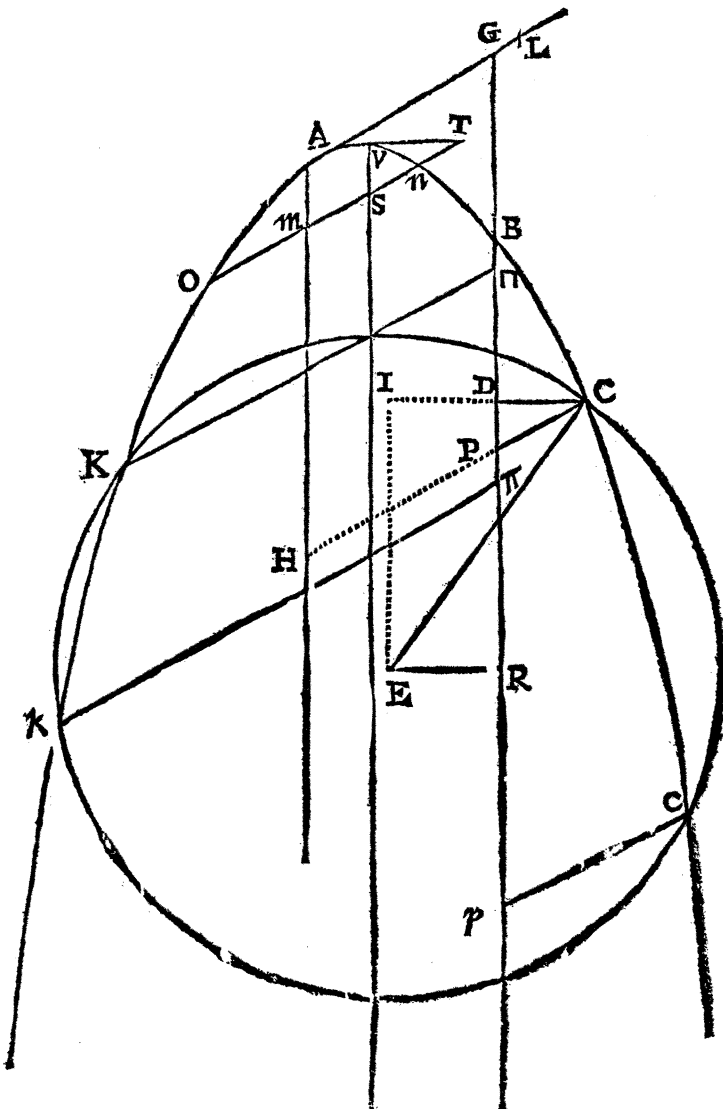
Data *Æquatione* quavis vel Cubica vel Biquadratica, instituenda est comparatio inter terminos ejus, terminosque respondentes hujus *Æquationis*

$$x^4 = \frac{2p}{q} x^3 + \frac{4pr}{q} x^2 + \frac{2p^2}{q} x + p^2, \text{ quo pacto facile satis}$$

$$\begin{array}{cccc} - 4r & - 4r^2 & - \frac{2p^2}{q} & - q^2 \\ & + 2s & + 4rs & - s^2 \\ & - 1 & - 2q & + t^2 \end{array}$$

eruentur ipsæ p, q, r, s, t ; earum interim unâ aliquâ utcunque pro lubitu assumptâ. Tum in Parabola quavis data AVB, cujus Vertex principalis V, Axis VS, & Axi

(2363)



perpendicularis VT; capiatur VS = p versus interiora Parabolæ, & in angulo SVT inscribatur ST = q, quæ producta Parabolam secet in punctis binis N & O. Bifecetur ON in M, & per M agatur MA Axi parallela & Parabolæ occurrens in A. Ipsi ON parallela ducatur AL, ut sit AL Latus rectum Parabolæ ad Diametrum AM, sitque hæc eadem Unitas. In AL (utrinque si opus est producta) capiatur AG = r, & à puncto G ducatur GR Axi parallela, quæ Parabolam secet in B, à quo capiatur BR = s. A novissime invento puncto R ducatur RE ipsi VT parallela & æqualis, quæ sinistram versus jaceat respectu ipsius R si q sit quantitas affirmativa, at versus dextram si q sit negativa. Atque idem de ipsis AG & BR intelligatur, quæ ad contrarias itidem partes duci debent, si modò valores ipsarum r & s prodeant negativi. Denique Centro E & Radio EC = t describatur Circulus CK^æc, qui Parabolam in totidem secabit punctis, quot sunt Æquationis datæ Radices recales. Etenim à punctis istis C, K, &c. ducantur CP, KN, &c. ipsi ST parallela, & ad rectam GR (si opus est productam) terminatæ, eritque harum quævis x, seu Æquationis datæ Radix quæsitæ; eæ scilicet ad dextram jacentes erunt Radices affirmativæ, quæ verò ad sinistram sunt positiæ erunt Radices negativæ. Punctum contactûs, siquod fuerit, hic sumitur pro intersectionis punctis duobus ad invicem vicinissimis.

Inter Æquationes Cubicas & Biquadraticas ita constructas hoc tantum intercedit discriminis, quòd in prioribus, ob terminum ultimum in præcedente Æquatione deficientem, semper fit $p^2 - q^2 - s^2 + t^2 = 0$, sive $t = \sqrt{s^2 + q^2 - p^2}$. Igitur Centro E & Radio EB ($= \sqrt{BRq + (ERq) STq - VSq}$) descripto Circulo CK^æc, Radicum una CP in priori constructione in nihilum abit.

Hæc autem demonstrantur ad modum sequentem. Momentibus jam constructis, & producta CP si opus est, donec secat AM in H, erit CH Ordinata Parabolæ ad Diametrum

metrum AH, & proinde $CHq = AL \times AH = AH$, ob
 $AL = 1$. At $CH = CP + AG$, & $AH = GB + BP$, &
 propterea $CPq + 2AG \times CP + AGq = GB + BP$; sed
 ob naturam Parabolæ erit $AGq = GB$, unde $CPq + 2AG$
 $\times CP = BP$. Jam à puncto C ad ipsam BP demittatur
 norma s CD, quæ occurrat etiam ipsi EI, ad BP rectæ pa-
 rallelæ, in puncto I. Propter similia Triangula CDP &
 TVS, erit $DP = \frac{VS \times CP}{ST}$ & $CD = \frac{VT \times CP}{ST}$, & pro-

$$\text{inde } CPq + 2AG \times CP = BP = DP + BD = \frac{VS \times CP}{ST}$$

$$+ BR - IE, \text{ five } CPq + 2AG \times CP - \frac{VS}{ST} CP - BR$$

$$= -IE. \text{ At } IEq = CEq - CIq = CEq - CDq$$

$$- VTq - 2CD \times VT = CEq - \frac{VTq \times CPq}{STq} - VTq$$

$$- \frac{2VTq \times CP}{ST} = (\text{ob } VTq = STq - SVq) CEq - CPq$$

$$+ \frac{SVq}{STq} CPq - STq + SVq - 2ST \times CP + \frac{2SVq}{ST} CP,$$

quæ igitur æqualis erit Quadrato ex Latere $CPq + 2AG$
 $\times CP - \frac{VS}{ST} CP - BR$. Atque hæc Æquatio ad termi-

nos p, q, r, s, t revocata ipsissima fit Æquatio proposita.

Hinc liquet, quòd eadem quævis Æquatio Biquadratica
 innumeras per Parabolam constructiones sortiri possit, pro
 indefinito valore quantitatis istius, quam ad arbitrium assu-
 mi posse jam diximus. Sed casus est simplicissimus faciendo
 $VS = p = 0$, & migrat constructio, si rem ipsam spectes,
 in vulgarem istam, in qua Radicum representatrices
 rectæ CP, &c. sunt ad Axem perpendiculares. Æquatio
 autem fit $x^4 = -4rx^3 - 4r^2x^2 + 4rsx - q^2$, quæ facile

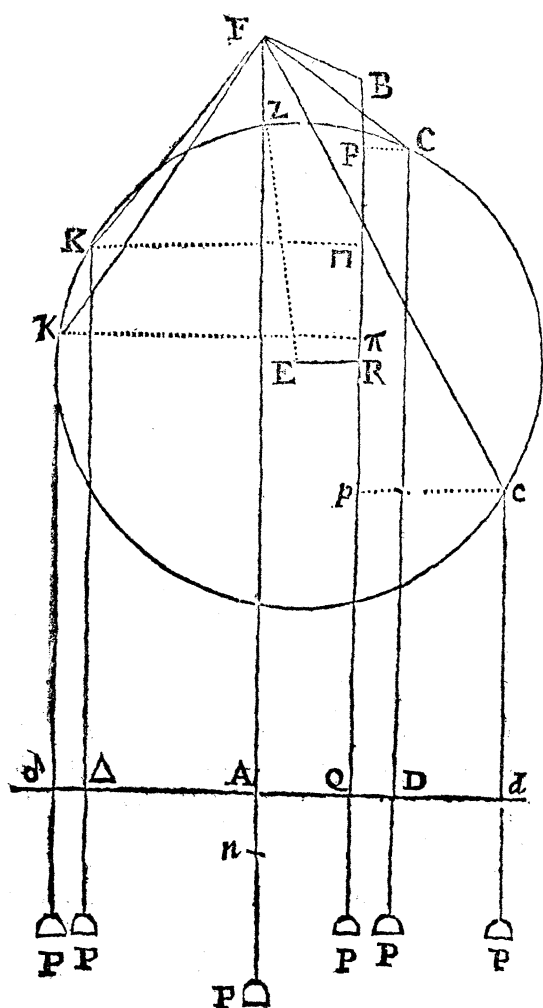
$$\begin{array}{rcl} + 2s & = & 2q - s^2 \\ - 1 & & + 1^2 \end{array}$$

construitur ut supra.

§ 4. Sed ne Parabolæ descriptio Organica difficilis nimium videatur, in promptu est Artificium quoddam Mechanicum, ope Fili penduli pondere instructi peractum, cujus auxilio quam exactissime & facillime *Æquatio* novissima construi potest, & proinde *Æquationum* quarumcunque Cubicarum & Biquadraticarum Radices inveniri; idque sine ullo linearum ductu nisi Rectarum & Circuli. Constructio autem, quam appellare libet *Mechanicam*, est ad hunc modum.

Contra Parietem erectum, vel planum aliud quodvis Horizonti perpendiculare, ad punctum aliquod *F* suspendatur filum tenuissimum & flexile *FP*; pondere quovis *P* ad extremitatem *P* appenso. In hoc filo notetur punctum aliquod *N*, à puncto suspensionis *F* satis remotum; vel filo parvulus, si id mavis, innectatur Nodus *N*. Et sumpta utcunque *NO* pro Unitate, ad punctum medium *A* ducatur (in plano prædicto) recta *AQ* Horizonti parallela, & utrinque quantum satis producta. Hisce generaliter paratis, pro particulari jam applicatione fac $AQ = r$, ipsis q, r, s, t , ut sæpius inculcatum, vel Arithmeticè vel Geometricè, pro datæ cujusvis *Æquationis*

ex-



exigentia, in *Æ*-
quatione novissi-
ma prius deter-
minatis. Tunc A-
cu vel Stylo tenu-
issimo, aut etiam
cuspide Circini
admodum gracili,
flectatur filum à
loco suo ad pun-
ctum quoddam
B, ita ut punctum
N cadat in no-
vissime invento
puncto Q. In BQ
ab isto B capiatur
 $BR = s$, & in R
ad ipsam BR per-
pendicularis eri-
gatur $ER = q$.
Verùm enim verò
istæ AQ, BR, RE
ad contrarias par-
tes ab earum ini-
tiis cadere debent,
si fortè valores
ipsarum r , s , q
prodeant negati-
vi. Denique in
puncto invento E

figatur Circini crus unum, & ad distantiam $EZ = t$ exten-
tum, agatur crus alterum in orbem, secumque circumducatur
filum FZP. Hac fili circulatione pondus P nunc ascendet
nunc descendet motu reciproco, ut & Nodus N nunc supra
rectam AQ extabit, nunc verò infra eandem deprimetur.
Quoties autem reperietur Nodus ille N in ipsa AQ, puta
in punctis D, d, Δ, Δ, ab scindet is rectas DQ, dQ, ΔQ, ΔQ.

quæ erunt *Æquationis datæ Radices omnes reales*; hæ nempe ad dextram erunt *Radices affirmativæ*, illæ verò ad finiftram *Radices negativæ*. *Demonstratio* est manifesta ex præcedentibus, habita tantùm ratione *Parabolæ* per puncta *B, C, c, x, x* tranſeantis. Nam poſito *F* foco *Parabolæ*, (cujus diſtantiâ à *Vertice* aſt $\frac{1}{2}$ *ON*,) notum eſt quod lineæ omnes ut *FB + BQ, FC + CD, &c.* eandem ubique conficiant ſummam.

Atque ex principiis hic poſitis proclive erit *Inſtrumentum* haud inconcinnum & quantumvis accuratum fabricari, cujus beneficio hujusmodi *Æquationum* quarumcunque *Radices* nullo fere negotio inveniri poſſint, & præ oculis exhiberi. Hoc autem quilibet, ſi id *Curæ* ſit, variis modis pro ingenio ſuo efficere poteſt, & de his jam ſatis.

III. *Æquationum quarundam Potestatis tertiæ, quintæ, ſeptimæ, nonæ, & ſuperiorum, ad infinitum uſque pergendo, in terminis finitis, ad inſtar Regularum pro Cubicis quæ vocantur Cardani, Reſolutio Analytica.*

Per Ab. De Moivre, R. S. S.

Si *n* Numerus quicunque, *y* quantitas incognita, ſive *Æquationis Radix quæſita*, ſitque *a* quantitas quævis omnino cognita, ſive ut vocant *Homogeneum Comparationis*: Atque horum inter ſe relatio exprimat per *Æquationem*

$$ny + \frac{nn - 1}{2 \times 3} ny^3 + \frac{nn - 1}{2 \times 3} \times \frac{nn - 9}{4 \times 5} ny^5 + \frac{nn - 1}{2 \times 3} \times \frac{nn - 9}{4 \times 5} \times \frac{nn - 25}{6 \times 7} ny^7, \&c. = a$$

Ex hujus seriei natura manifestum est, quod si n sumatur numerus aliquis impar (integer scilicet, nec refert utrum sit affirmativus vel negativus) tunc series sponte sua terminabitur, & Æquatio fit una ex supra præfinitis, cujus Radix est

$$(1) \quad y = \frac{1}{2} \sqrt[n]{\sqrt[n]{1+aa+a} - \frac{\frac{1}{2}}{\sqrt[n]{\sqrt[n]{1+aa+a}}}}$$

$$\text{vel (2)} \quad y = \frac{1}{2} \sqrt[n]{\sqrt[n]{1+aa+a} - \frac{1}{2} \sqrt[n]{\sqrt[n]{1+aa} - a}}$$

$$\text{vel (3)} \quad y = \frac{\frac{1}{2}}{\sqrt[n]{\sqrt[n]{1+aa} - a}} - \frac{1}{2} \sqrt[n]{\sqrt[n]{1+aa} - a}$$

$$\text{vel (4)} \quad y = \frac{\frac{1}{2}}{\sqrt[n]{\sqrt[n]{1+aa} - a}} - \frac{\frac{1}{2}}{\sqrt[n]{\sqrt[n]{1+aa} - a}}$$

Exempli gratia, sit hujus Æquationis potestatis quintæ $5y + 20y^3 + 16y^5 = 4$ Radix invenienda, quo in casu erit $n = 5$ & $a = 4$. Radix juxta formam primam

$$\text{erit } y = \frac{1}{2} \sqrt[5]{\sqrt[5]{17+4} - \frac{1}{2} \sqrt[5]{\sqrt[5]{17+4}}}, \text{ quæ in numeris vul-}$$

garibus expeditissime explicari potest ad hunc modum. Est $\sqrt[5]{17+4} = 8.1231$, cujus Logarithmus 0.9097164, & hujus pars quinta 0.1819433, huic respondens numerus est

1.5203 = $\sqrt[5]{\sqrt[5]{17+4}}$. Ipsius vero 0.1819433 Complementum Arithmeticum est 9.8180567. cui respondet numerus 0.6577 = $\frac{1}{\sqrt[5]{\sqrt[5]{17+4}}}$ Igitur horum numero-

rum semidifferentia 0.4313 = y.

Hic venit Observandum quod loco Radicis generalis, non incommode sumeretur $y = \frac{1}{2} \sqrt[n]{2a} - \frac{1}{\sqrt[n]{2a}}$, si quan-

do numerus a respectu unitatis, si satis magnus, ut si Æquatio fuerit $5y + 20y^3 + 16y^5 = 682$, erit Log. $2a = 3.1348143$, cujus pars quinta 0.6269628, & huic respondens numerus 4.236. Complementi autem Arithmetici 9.3730372 numerus est 0.236 & horum numerorum semidifferentia $2 = y$.

Atqui præterea, si in Æquatione præcedenti signa alternatim sint affirmantia & negantia, vel quod eodem redit, si series obvenierit hujus modi

$$ny + \frac{1 - nn}{2 \times 3} ny^3 + \frac{1 - nn}{2 \times 3} \times \frac{9 - nn}{4 \times 5} ny^5 + \frac{1 - nn}{2 \times 3} \times \frac{9 - nn}{4 \times 5} \times \frac{25 - nn}{6 \times 7} ny^7, \&c. = a$$

erit hujus Radix

$$(1) \quad y = \frac{1}{2} \sqrt[n]{a + \sqrt{aa - 1}} + \frac{n \frac{1}{2}}{\sqrt[n]{a + \sqrt{aa - 1}}}$$

$$\text{vel } (2) \quad y = \frac{1}{2} \sqrt[n]{a + \sqrt{aa - 1}} + \frac{1}{2} \sqrt[n]{a - \sqrt{aa - 1}}$$

$$\text{vel } (3) \quad y = \frac{n \frac{1}{2}}{\sqrt[n]{a - \sqrt{aa - 1}}} + \frac{1}{2} \sqrt[n]{a - \sqrt{aa - 1}}$$

$$\text{vel } (4) \quad y = \frac{\frac{1}{2}}{\sqrt[n]{a - \sqrt{aa - 1}}} + \frac{\frac{1}{2}}{\sqrt[n]{a + \sqrt{aa - 1}}}$$

Hic autem Notandum, quod si $\frac{n-1}{2}$ numerus extiterit impar, Radicis inventæ signum in ei contrarium permutandum est.

Pro.

Proponatur Aequatio $5y - 20y^3 + 16y^5 = 6$, unde
 $n = 5$ & $a = 6$. Erit Radix $= \frac{1}{2} \sqrt[5]{6 + \sqrt{35}} + \frac{1}{2}$

$$\sqrt[5]{6 + \sqrt{35}}$$

Vel quoniam $6 + \sqrt{35} = 11.916$, erit hujus logarithmus 1.0761304 & ejus pars quinta 0.2152561 , Complementum vero Arithmeticum 9.7847439 . Horum Logarithmorum numeri sunt 1.6415 & 0.6091 respective, quorum semisumma $1.1253 = y$.

Verum si acciderit ut a sit minor unitate, tunc Radicis forma secunda, ut quæ proposito est magis conveniens, præ reliquis feligenda est. Sic si Aequatio fuerit $5y - 20y^3$

$$+ 16y^5 = \frac{61}{64}, \text{ erit } y = \frac{1}{2} \sqrt[5]{\frac{61}{64} + \sqrt{\frac{375}{4096}}}$$

$+ \frac{1}{2} \sqrt[5]{\frac{61}{64} - \sqrt{\frac{375}{4096}}}$. Et quidem si Binomialium Radix quintana ullo pacto extrahi queat, prodibit Radix proba & possibilis, etsi expressio ipsa impossibilitatem mentiat. Binomialis vero $\frac{61}{64} + \sqrt{\frac{375}{4096}}$ Radix quintana est $\frac{1}{4} + \frac{1}{4}\sqrt{-15}$, & Binomialis $\frac{61}{64} - \sqrt{\frac{375}{4096}}$ Radix itidem quintana est $\frac{1}{4} - \frac{1}{4}\sqrt{-15}$, quorum Binomialium semisumma $= \frac{1}{4} = y$.

Si autem extractio ista vel non peragi posset, vel etiam difficilior videretur, res ubique confici potest per Tabulam sinuum naturalium ad modum sequentem.

Ad Radium 1 sit $a = \frac{61}{64} = 0.95112$ sinus arcus cujusdam, qui proinde erit $72^\circ : 23'$ cujus pars quinta (eo quod $n = 5$) est $14^\circ : 28'$; hujus sinus $0.24981 = \frac{1}{4}$ proxime. Nec secus procedendum in Aequationibus graduum superiorum.

Several Experiments shewing the strange Effects of the Effluvia of Glass, produceable on the Motion and Attrition of it. By Mr. Fr. Hauksbee, F.R.S.

Experiment I.

Containing farther Observations on the Attrition of Glass.

IN the late Experiments, which seem something to Illustrate Attraction or Electricity, by the Ends of the surrounding Threads pointing to the Axis of the Affricated Glass, there is something farther very Remarkable, and worthy Consideration ; which is, That after the Attrition of the Glass has been a little while continu'd, and the Effluvia laid hold on the hairy or woolly Threads, (for I made use of such as we call Crewel,) that then, notwithstanding the rubbing was ceas'd, and the Glass motionless, yet all the Threads would continue their directed Posture for four or five Minutes, and sometimes longer, before they could disengage themselves from the Attracting or Electrical Effluvia. Moreover, if one's Finger (or any thing else is as well, for I have try'd divers things,) be approach'd near the pointing ends of the Threads, while the Effluvia act with so much vigour, as to sustain them directed ; that then, I say, they would flee and avoid a touch from it ; as if the North Pole of the Magnet was apply'd towards the South Point of a Needle : And at the same time, if the Finger is held near, at about an Inch from the end of the aforesaid Thread, it will there seem

to be attracted, it removing its self something out of its place to the approach'd Body. But if any thing is held between the Glass and the directed Thread, then the Thread immediately looses hold of the Effluvia, and retires to its first Position; yet upon withdrawing the Interpos'd Body, (if it has not remov'd it self too far out of the Reach of the Effluvia) it will again return to its Tendency, and so remain, till the weight of its Body is too great for the declining strength of the Effluvia to support it in such a Direction. I have since try'd the same Experiment with a Globe Glass, which when the Attrition was made, would in all manner of Positions attract the surrounding Threads, directing them towards its Centre.

Experiment II.

Touching the Direction of Woollen Threads every way from the Axis, towards the Circumference of an Affricated Glass.

HAVING Prosecuted the Experiments of Attrition on the outside of Glass with some Success, Several notable Phenomena having been exhibited by them, (and I think what the World in a great measure has not been acquainted withal before,) I thought it would not be amiss to continue them a little farther, by trying what Appearances might be afforded by placing the Woollen Threads, as heretofore us'd on the outside, on the Axis within, and the Attrition to be made on the outward surface as usual; not doubting, if any such Effluvia were by that means emitted within, that then the Threads, which should be fix'd on the Axis, would extend themselves, and point every ways towards the Circumference of it. In order therefore to put it to the issue, I took a Globe Glass about six Inches Diameter, and having convey'd in-

to the Body of it some Woollen Threads ty'd to a stick, which was plac'd in it as an Axis, and being fix'd on the Machine, the great Wheel was turn'd, and the Hand apply'd as usual, but soon I found the Inconvenience of a Glass of that form, the Threads entangling one with another, and there was no way to loose or separate them; however they seem'd then to me to be dispos'd (had they been at Liberty) to have answer'd my expectation. But this is not all that occur'd at that time, for bringing my Hand near the Glass, which was then at rest, I was surpriz'd to see a Motion of the Bodies within side; and upon enquiry, found it was occasion'd by the Approach of my Hand, since I could by a motion of my Finger towards the Point of any of the Threads that touched not the inside of the Glass (but nerely so was best) drive it any way; it seem'd to fly my Finger held on any side of it, and this without touching the outward surface by half an Inch or more. Now when this Experiment was made by hanging the Threads near the outside, it was very odd (as before related) to see them fly the Approach of a Finger; yet how much more surprizing is it, to see the same perform'd even when a Body so solid as Glass interposes; which shews the subtilty of the Effluvia, the Body from which it is produc'd seeming to be no Impediment to its motion: Besides it seems very much to resemble or emulate a Solid, since Motion may be given to a Body, by pushing the Effluvia at some distance from it: But what is still more strange is, That this Body (I presume to call it so) altho' so subtil as seemingly to perviate Glass, will not (as I have taken notice of in a former Experiment) affect a light Body thro' a piece of Muslin: Now whether the Muslin absorbs the Effluvium, or what other Laws it may be subject to, I cannot tell, but sure I am 'tis very amazing, and I think, with submission, worthy the Consideration of this Honourable Society.

I have try'd the same with a Glafs exhausted of its Air, but it afforded nothing worthy to be taken notice of.

Experiment III.

Being a Repetition and Improvement of the former.

I since procur'd a Glafs of a more futable form for a Repetition of the foregoing Experiment. See *Fig. 1.*

Fig. 1.

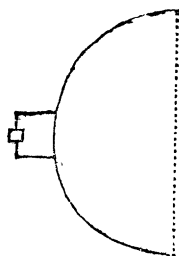
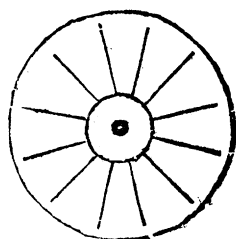


Fig. 2.



This Glafs was screw'd by the Neck to one end of a Spindle, and had motion given it by the large Wheel as usual. This manner of fixing, and Figure of the Glafs, gave me the Liberty of rubbing it as well within as without, altho' on tryal I find, that either way is much the same; for when the Threads are held within, and the Attrition made on the outside, or the contrary, or the friction made on the same side the Threads are us'd, makes very little difference. To proceed: When the Threads were fix'd on an Axis within, and the Motion and Attrition made as usual, the Threads did then represent (as I before expected) a form like *Fig. 2.* And during its resembling that Figure, if a Finger was approach'd near the outside of the Glafs, a motion would be given to the point of the Thread nearest it within, and at the same time, if the Threads
the

were remov'd to the outside, and the Finger held within, the like motion would be given to them there. Generally the Threads seem to fly the Approach of the Finger ; yet sometimes I have seen them jump suddenly towards it, at more than an Inch distance.

To conclude this Experiment ; It is worth taking notice, That the Figures represented by the directed Threads, from, and towards the Centre, not only mimick, but seem most lively to resemble the centripetal, and centrifugal Tendencies of Bodies in their Motions either ways.

Experiment IV.

Shewing, That the Effluvia of Glafs, are Capable of Performing the Office of Attrition ; Causing a Light, by falling on an Exhausted Glafs in Motion, (as if rubbed by the Hand.)

THAT the *Effluvia* of Glafs are very considerable in the Production of divers *Phænomena*, has already been abundantly prov'd ; but that they should act the Part of a Solid Body, by performing the Office of one, is still more admirable ; And that they do so, the following Experiment sufficiently demonstrates, and seems to corroborate a hint I gave in the 2d Experiment of their Emulating such a Body, by causing a Thread to fly the approaching Finger. I took a large Globe Glafs about 9 Inches Diameter, which having exhausted of its Air, I fixt to give Motion to it, by the Machine describ'd in *Philos. Transact.* Numb. 304. its *Axis* standing Perpendicular. Another Globe Glafs about the bigness of the former, was plac'd to give Motion to it by a new Machine, and was wrought with its *Axis* parallel to the Horizon. This last mention'd Globe, with its Content of common Air,

was

was fixt to move within an Inch of touching the other. In these Postures the Machines were set on work, and the naked Hand apply'd to the unexhausted Glafs, the *Effluvia* of which in a little time reaching the exhausted Glafs in Motion, immediately produc'd a Light on that part of it nearest to the other, without the assistance of a touch from any thing else to influence it. This Light is pretty vigorous, and extends it self so far on the Globe as the *Effluvia* are capable to lay hold on't; It is nothing so much of a Purple Colour, as when it is caus'd by the Attrition of the Hands; but will continue, or live on the Globe for half a Minute or more, after the Motion of the rubb'd Glafs is ceas'd: But if the rubb'd Glafs is kept in motion, and the other at rest, the Light instantly dies, yet recovers again upon the first motion given it. After this I took a long Glafs, which had lain by me exhausted of its Air for more than six Months: This Glafs having been rubb'd a little with my Hand to expel the Humidity on its outside, I held it over the unexhausted Glafs in Motion, which at the same time was rubb'd by my Hand. It would now and then (for it was not constant) be very surprizing to see what large Flashes of Light would be produc'd in the long Glafs without touching the Glafs in motion, nor was it self either mov'd or provok'd by any immediate Attrition.

V. Tabula exhibens *Cœli tempestates*, & mutationes, ter unoquoque die : Item Plagam *Ventorum*, & *Nubium* ; Altitudinem *Mercurii* in *Barometro*, & *Spirituum* in *Thermometro* ; & denique *Pluvie* quantitatem, quæ quibusdam diebus, & unoquoque Mense, per Infundibulum 12 pollices latum, apud *Upminster* in *Comitatu Effexie* decidebat Anno 1705. Per *W. Derham* Rectorem *Upminsterensem*, & S. R. S.

JANUARIUS.				7	12	9
	Cœlum.	Ventus.	Nube.	Barom.	Th.	Pluvia.
5	Gelu.	Nb W o	NE	30 14	79	
	Apricum.	I		17	90	
	Nubilum.			16	87	
10	Gelu cum	W o		21	82	
	Aere craſſo.	E b S o		22	93	
				25	87	
15	Gelu ſevum	W b N I		00	74	
	& nubilum.	SW o		29 97	85	
	Regelat.			93	95	
20	Gelu & Dies	E I		30 03	73	
	apricus.	E b S I		06	96	
				13	82	
25	Nebula.	E b S I		29 79	92	o 36
	Clarius.	ESE I		80	103	
	Nubilum.			81	92	
30	Nubilum.	N I	Nb E	30 03	87	I
	Ningit.	Nb E I		02	97	I I I
	Nubilum.			29 99	90	

FEBRUARIUS.

(2379)

FEBRUARIUS.						
	Cœlum.	Ventus.	Nubes.	Burom.	Th.	Pluvia.
		S 2		28 89	98	
5	Pluviæ.	SE b S 2		77	102	
				78	93	2 68
10	Apricum. Nebulosum. Pluvia.	SSE 1 S 5	SW b S	29 85	97	
				81	115	
				66	107	
15	Gelu. Apri- citas cum te- nui nebula.	Nb W 0		30 39	84	
				31	88	
20	Nebulosum.	E b N 2		03	92	
				29 97	100	
	Nubilofum.			86	95	
25	Gelosum. Apricum. Pluviofum.	S b E 1 S 2	SSW	28	81	
				27	115	
				19	95	
				Sum. Pluviæ		1. 5 53

MARTIUS.						
	Cœlum.	Ventus.	Nubes.	Burom.	Th.	Pluvia.
	Nubilum.	NNE 3	NE	29 61	94	
5	Serenum.			65	90	
10	Gelu. Apricum. Nubilum.	S 0 ENE 1	W b N	41	86	
				40	112	
				40	90	
15	Pluvia.	E 1	S	24	94	
				17	105	
20	Caliginofum cum Imbri- bus nivosis.	N b E 2		65	83	
25	Clarius cum guttulis ni- vosis.	Nb W 2		21	83	
				33	104	
				48	81	
30	Turbidum & pluvio- fum.	S b W 3 SW 8		35	116	
				30	127	1.
				22	108	5 55

(2380)

A P R I L I S.				5	12	9
	Cœlum.	Ventus.	Nubes.	Barom.	Th.	Pluvia.
5	Nubilofum.	WSW 1		29 72	102	
	Turbidum.	SW 5		70	122	
	Græ.			66	120	
10		E b N 1	S b W	34	98	
	Pluviofum.			32	117	
				25	106	
15	Gelu cum	No		82	79	
	Apricitate.			90	116	
	Nubilum.			96	98	
20	Nubilofum.	W b S 1		91	101	
		W 2		92	134	
	Placidius.			85	120	
25	Pruna. To-	W o	N b W	70	86	
	nitru cum	1	N b W	80	125	
	Grand. pluv.			87	117	
30	Sudum	W b N 1		68	100	
	&					
	Calidum.			73	109	1. 5 15

M A I U S.				5	12	9
	Cœlum.	Ventus.	Nubes.	Barom.	Th.	Pluvia.
5	Dies nubi-	SW b S 1		29 61	115	
	lofus.	S b W 3		56	150	
				55	120	
10	Nubilum.	SSW 1	N W	30 07	101	
		W b N 2		05	142	
	Apricum.			29 98	121	
15	Imbres	NW b N 2		80	92	
	Grandinis					
	& Pluvie.			95	97	0 22
20	Nubilum.	N 1		78	106	
		N b E 2		78	124	
	Apricum.			80	113	
25	Nubilum &	N b E 2	N N E	85	93	
	Frigidum.	N 2		91	120	
	Clarius.			96	101	
30	Nubilum	W b N 1		71	98	
	&					
	Frigidum.			85	90	1. 2 05

J U N I U S.

(2381)

JULIUS.						
	Cœlum.	Ventus.	Nubes.	Barom.	Th.	Pluvia.
5	Nubilum & Calidum. Guttæ.	SW 1 NNW 1	W WNW	29 62 65 64	119 143 120	
10	Apricum cum Calid. Nubil. Pluv.	ESE 2 Ebs 2	SEbs	30 01 01 29 94	110 153 126	0 30
15	Nebula. Apricitas fervida.	Wbs 1 2		92 92 92	127 152 132	
20	Nubilum. Fervidum. Minus servi.	E 1		95 94	125 125	
25	Nubilum. Guttæ. Imber.	SWbW 2 W 3		62 59 50	137 151 131	0 08
30	Nebula. Apricitas fervida.	No W 1		84 92 94	106 156 134	1. 2 20

JULIUS.						
	Cœlum.	Ventus.	Nubes.	Barom.	Th.	Pluvia.
5	Apricum. Pluvia. Pluvia.	W 0 NW 2	NW	30 08 08 10	122 139 116	0 82
10	Nubilum. Imber & mi- nus calidum	NbW 3 5		29 79 83 30 00	112 127 118	
15	Apricum. Fervor æstu- ofus.	Ebs 0 S 2	N	29 96 93 90	112 163 145	
20	Apricitas cum fervore. Nubilum.	SWbW 0 NNW 2		30 03 03 03	115 164 136	
25	Nunc Apri- cum : Nunc Nubilum.	WbS 0 SbW 3	W	29 72 69 66	110 170 148	
30	Apricum. Nubilum. Minus nubil.	WbS 1 SW 2		79 82 82	116 151 135	1. 5 56

AUGUSTUS.

(2382)

AUGUSTUS.				5	12	9
	Cœlum.	Ventus.	Nubes.	Barom.	Th.	Pluvia.
5	Nubilum. Minus Nubilum.	WSW 1 WbN 1	W	29 82 86 86	133 158 148	
10	Apricitas Ventosa. Nubilofum.	SSW 3 SW 6	SW	48 56 44	131 158 138	
15	Turbidum. Nubilofum.	SW 0 SSW 1		97 94 82	109 153 132	1 00
20	Apricum. Guttæ. Minus nubil.	S 1	SW	61 65	120 129	
25	Apricum. Guttæ. Minus nubil.	W 1 WNW 6	NW	34 42 49	105 128 117	0 07
30	Multa Pluvia.	S 1 SbW 4	SSW	68 71 71	127 142 124	1. 10 81

SEPTEMBER.				6	12	9
	Cœlum.	Ventus.	Nubes.	Barom.	Th.	Pluvia.
5	Nunc Apricum, nunc Nubilum.	SWbW 0 3	WSW	29 88 88 84	107 144 118	
10	Nubilum.	SSW 0	SW sup. NW inf.	77 86	102 108	
15	Imber. Nubilum. Nebulofum. Nubilum.	WNW 0 W 1	NbW NW	30 13 15 15	119 145 129	
20	Nubilofum.	E 1 EbN 4		25 25 22	124 138 128	
25	Pluviola.	SWbS 1 SSW 0		29 36 38 40	110 122 113	
30	Pruina & Apricitas.	NW 0 WbN 1		48 50 42	93 112 92	2 04

OCTOBER.

(2383)

OCTOBER.				7 .	10 .	9
	Cœlum.	Ventus.	Nubes.	Barom.	Th.	Pluvia.
5	Nunc Im- bres, nunc Apricum.	S 1 S b W 2		23 93 99 29 10	111 127 111	0 56
10	Nebula crassa. Apricum.	S E 0 E S E 0		93 98 30 05	101 128 108	
15	Nubilolum. Apricum.	WSW 2	W	29 75 78	98 108	
20	Apricum. Nubilum. Tonitru, &c.	S E 1 E b S 2 E N E 2	S E b E	2 18 16 22	86 112 108	5 69
25	Apricum & Frigidum.	N 2 3		86 92 30 04	89 103 87	
30	Gelu cum Apricitate.	N b E 2		29 94 30 00	87 89	1. 16 01

NOVEMBER.				8 .	12 .	9
	Cœlum.	Ventus.	Nubes.	Barom.	Th.	Pluvia.
5	Gelu, & Apricitas. Nubilum.	E N E 1 E b N 1	E	29 68 72 72	83 103 101	
10	Nubilum.	S 2		80	103	
15	Pluriosum. Gelofum & Apricum.	6		44 30 05	120 80	0 27
20	Nebula cras- sa. Pluvia. Turbidum.	N 2 W 1 9		29 57 57 35	89 89 98	0 91
25	Gelu & nebula te- nuis.	W 0		65 67 71	79 85 76	
30	Neb. tenuis. Nubilum Pluit.	S b W 2 4	SSW	10 10 28 84	102 112 111	5 84

DECEMBER.

(2384)

DECEMBER						
	Cœlum.	Ventus.	Nubes.	Barom.	Th.	Pluvia.
5	Nunc Nubilum, nunc Apricum.	W 2 W b N 3	NW	29 10 25 46	92 102 92	
		NNW 1		45	83	
				61	89	
10	Nabilum.					
15	Pluviola.	SWbW 1 W b S 3		34 36 31	100 101 95	
	Pluit.					1 21
	Pluit.	S 1		28 73	94	
20	Clarius. Gelu.			73 76	100 84	
						1 83
	Nubilum.	Nb E 1	NNE	29 72	94	
25	Pluvia. Nivosa.			76 90	96 88	
						0 48
		SEbS 1		92	87	
30	Caliginosum	SE 1		90 86	88 85	1. 21 70

*Res in his Tabulis, & Anno 1705. maximè notabiles,
cum Tabularum explicatione.*

TAbulæ meæ ampliores ad Annos 1697-98 & 99, in Philof. Tranfact. Editæ sunt. Sed quoniam Typographis ingratae fuere, ideo uno vel alio modo compendiosius excusæ sunt, usque ad Annum 1705. Et quandoquidem viris doctis & curiosis, tum indigenis, tum exteris, gratas fuisse comperi, & præcipuè insignissimæ nostræ Societati Regiæ, ideo meum esse existimo pertexere quod exorsus sum. Et ut Doctis usui esse possint, & Typographis non graves, ideo quantum tantum diem cujusque mensis excerpti; quod commodum Anni dabit conspectum.

Non

Non multâ explicatione præter Titulum indigent hæ Tabulæ, nisi in Columnis *Ventorum* & *Nubium* (in quibus usus sum Notis Anglicanis.) Quippe eorum varietas Romanis non innotuit.

Quatuor Plagæ principales his literis notantur, viz. N. Septentrio: S. Meridies: E. Oriens: W. Occidens.

Plagæ intermediæ harum literarum conjunctione denotantur. E. g. NW. denotat ventum, quem Seneca vocat *Corum*, quem a Solstitiali occidente flare dicit. SW *Africum*, qui ab occidente hiberno flat, uti Seneca. SbW denotat plagam illam quæ proximè juxta Meridiem sita est: SSW proximam huic: SW bS huic proximam, si-ve quæ sita est inter hanc & *Africum*: Et sic de cæteris.

Notæ numerales Ventis adjecæ indicant Ventorum vim. Cyphra [0] notat Aeris tranquillitatem, si-ve nullum flare Ventum. [1] Ventum adeo languidum denotat, ut candelam accensam viæ extinguere valeat. [2] fortio-rem. [7, 8 ad 12, 15 vel 20] denotant Ventos violentos, & magis bacchantes.

Quoad Columnam *Thermometri*, notandum est, *Gelationis* gradum esse circa 85. Sed Pruina eveniet circa 90, vel paulo supra.

In Columnâ *Pluviarum*, aliquando notavi Pluviæ pondus, quod in diebus pluviosis (in Tabulâ notatis) decidit. Et in fine cujusque Mensis Summa Pluviæ totalis istius mensis notatur. In toto hoc Anno 84,62 Libræ Pluviæ deciderunt, istarum Librarum quas Angli *Troy weight* vocant.

Infundibulum Pluviam recipiens est circulare, cujus Diameter 12 pollicibus Anglicanis æqualis est.

Denique hæ Observationes ter de die facta fuere, nisi absens, vel aliter occupatus essem. Horæ observandi, tum ante, tum post Meridiem, in summitate cujusque mensis notantur.

Circa finem Februarii, & per maximam Martii partem, Nostrates *Dyspnœa*, & *Tussi* ubique fere affecti sunt. Judi-

cent Medici, an hæc proveniant à Ventis orientalibus, unà cum frigida & humida cœli temperie, quod tunc frigidum, non autem gleosum fuisse, hæc breviores, & præcipuè majores meæ Tabulæ ostendunt.

Apr. 1. Mane *Parelia* ab aliis visa sunt; sed mihi non contigit videre.

Junius mensis adeo fervidus & siccus fuit ut Aquæ defecerint, Fruges languerint, Gramen arefactum fuerit. Drosomelia quoque frequentia fuere. Et Secale ubique uredine tactum.

Aug. 11. Ventus adeo bacchatus est, ut perniciosissimus arborum fructibus, eorumque emptoribus fuerit.

Et quamvis pluvia copiosa successit, tamen Stagna arida fuere in Septembre, & magna Graminis inopia.

Dec. 19. Maximus fuit (ut opinor) *Mercurii in Barometro Descensus* hoc mane; sequenti modo,

8 ^h $\frac{1}{4}$ mane	————	28,28 pollices
10	————	28,06
11	————	27,94
11 $\frac{1}{2}$	————	27,94
12 $\frac{1}{2}$	————	28,03
1 p.m.	————	28,13
1.10'	————	18
1.20' Ventus W	7 ———	20
2. Ventus W	9 ———	34

Cœli autem Tempestatumque mutationes non adeo notabiles, ac Mercurij. Tantùm ventus post meridiem vehemens fuit, & noctu multum Pluviæ. Sed audivimus calamitosissimam tempestatem Corbili eodem die fuisse.

Hic maximus Mercurii descensus ab aliis observabatur. In Observatorio Grenovicensi ad 27,80 pollices Mercurius descendebat; Cantuariæ urbis ad 27,90.

In supputatione Pluviæ penè oblitus sum Profunditatem Pluviæ notare. Si terra non absorpssisset, ad 16,924 polli-

ces Anglicanos ferè exurrexisset. Hic Annus ideo pro sicco habendus est. Nam proportio Pluviæ media singulis Annis est circa $20\frac{1}{2}$ pollices *Upminsteri*; $42\frac{1}{2}$ *Townelei* in comitatu *Lancastriæ*; & 22 *Parisiis* in *Galliâ*; & 24 pollices in urbe *Flandriæ* vocatâ *Insulæ*, uti observavi in *Phil. Transf.* N. 297.

VI. *An Account of Balls of Hair taken from the Uterus and Ovaria of several Women; by Mr. James Yonge, F.R.S. Communicated to Dr. Hans Sloane, R.S. Secr.*

IN November 1705, I was call'd to deliver a Woman 30 Years old, who had 4 Days laboured in vain to bring forth her first Child: The Head, being too big for the Passage, stuck immoveable at the *Os pubis*; so that I could neither fasten a Crochet, nor draw it out by a Cupping-Glass fixt to the Scalp with an Air Pump.

In this Extremity I directed my Son to open the Childs Head, and take out all the Brains, with so much of the Scull as he could; and then by a Cord fastned round the Neck with a Nooze, to pull it out, which was soon and easily done.

The Child was Corrupted and stunk much, so did the *Lochia*, which flowed three Weeks; soon after they ceased, the *Menstrua* appeared, and the Woman went abroad: About six Weeks after her Delivery, she was seized with violent Convulsions, and Hysterick Fits, which lasted near three Days; when a painful Tumor arose in the left side of her Belly, which ended in an Eruption of white thick Matter near a Pint, with small Knobs of a Substance like the Yolk of boiled Eggs: All Symptoms immediately vanished, only she complained of the great Hollownes where the Tumor had been.

Four Days after this, the like Swelling appear'd on the right side of her Belly, which continued with a small Flux of Matter about five or six Months, in despite of the many Remedies I used to cure her.

About that time there appeared in the *Pudenda* a Bunch of something like greasy Wool, which being drawn forth, proved a Ball, or Wad of Hair, the bigness of a Turkeys Egg, immersed in an Unctuous Slime; adhering on one side to a Membrane so large as the Palm of a Mans Hand: And in the midst of it a small Pyramidal Bone resembling a split Tooth. The Tumor sunk upon this, and the Fluor ceased immediately, and her Lunary Flux (which all this while had not appeared) flowed as usual, and she continueth in perfect Health ever since, full nine Months.

You will herewith receive the Membrane, (somewhat shrunk and dry,) together with the Bone, and *Folliculus*, to lay before the R. Society, whose Sentiments I shall humbly wait to know. The Bone is perfectly such, so is the Hair, being fine, soft, and indifferently strong, of no great length, of a light brown Colour, intangled like a parcel of Combing.

Dr. Hook's
Phil. Collect.
N. 2.

This Case, though rare and extraordinary, hath sometimes hapned to others. That Famous Naturalist Dr. Tyson, who hath so much obliged the World by his Labours and Discoveries, tell us, That in November 1679. he dissected a young Gentlewoman, and found the right Testicle, or *Ovarium*, swoln into two Bags, almost so big as a Mans Head, full of a pale *Serum*, in which floated several Lumps of a soft fat Matter, which dissolved in part when put into hot Water. One of those Pieces was half so big as a Man's Fist, in which lay a great deal of Hair (as there did though not so plentifully in all the rest) of a Silver Colour, soft, fine, strong, and above two Foot long; it was not fasten'd to, nor seemed to grow from any part, but lay intangled in this Matter, and in it a

Bony

Bony Substance exactly resembling that which is commonly called the Eye or Dog-Tooth.

Another time dissecting a Woman forty Years old, he found near the *Uterus*, a Bag so big as a large Turkey-Egg, and in it a fatty Substance, like that above mentioned, with a great quantity of light soft Hair fastned to a fleshy Substance : Within this *Cystis* a Bone, in some sort resembling a Mandible, having several Sockets, in which were seated there *Dentes Molares*, or Grinder Teeth, and a fourth not yet quite grown out.

The Learned and Inquisitive Doctor *Grew* tells us, That *Mus. R. S.* in your *Museum* lyeth such another Tooth, found by *P. 15.* Dr. *Tyson*, after the same manner. And the Doctor himself tells us, *ubi supra*, That the great Dr. *Needham* found a Tooth and Hair in the *Ovarium* of a dead Woman. And Dr. *R. Hook* (whose Death I have a thousand Reasons to lament) saith, That Dr. *Samson* found the like in two great Globose Tumors depending on, or rather parts of the extended *Ovarium*, wrapt up in dissoluble and inflammable fat, of a yellow Colour.

About ten Years since, Sir *Andrew Leak* (who now lyeth in the Bed of Honour) gave me a small Bunch of Hair, being part of what had been found in the Belly of a young Woman at *Deal*, by Mr. *Jos. Nichols* a Surgeon there ; I send you that Hair, with a short History of it, by leave from the kind Hand who lately imparted it to me.

A. D. 1696. A Virgin of thirty fell into a Periodical Fever, and afterward a total suppression of her *Menses* ; which was soon followed with a Pain and Tumor in the right side of her Belly, which grew and encreased, maugre all the Remedies advised by the Neighbouring Physicians, till it became bigger and harder than that of a Woman in her last Month. When it had grown a full Year, it began to soften, and then the Censorious People who suspected her Honesty, thought her in a Dropic.

At

At fifteen Months end, the Belly was so distended, that it seemed ready to Burst; which made the Patient desire the Physicians to advise Mr. *Nichols* to make the *Paracentesis*; but all were surprized, when instead of Water there rushed out a pint and half of sweet well-digested Matter: The next Day he let out as much more, and then perceived Hair four or five Inches long issue forth with the Matter, but so fastned in the Inside, that he could not pull them out, the Woman complaining he would draw out a piece of her Belly.

She lived but four Days after the Operation; and on Dissection of her Belly there was found ten Quarts of the same Matter which flowed through the Tap-hole, and in it floating a Lump of Hair so big as an Halfpenny Loaf, wrapt up in a fatty Matter, from which being cleansed, it weighed full half an Ounce. On the Right side of the Womb he found a Protuberance bigger than a large Walnut, from which the Hair grew eight Inches long; that Tumor, or rather the *Ovary* being separated from the *Matrix*, there was found in it a perfect Dog-Tooth socketed in a Bone of a triangular Figure, in which another Tooth was growing; the Bone had a *Periostium* on it surrounded with Flesh, fastned at the *Calvaria* to the Skull.

If you desire to see those things, or to have a more particular account of this Dissection, Mr. *Nichols* will oblige you with the same freedom and readiness he hath done your Servant.

My Patient's Case hath two Difficulties in it which I can't get over, *viz.* How these Substances got in where they lodged? And how they got out thence by the way they did? Without doubt they were nested in or near the Testicle; the place of Tumor and Pain, and the many Anatomical Discoveries made by those great Philosophers I have quoted, do ev'n demonstrate it: They could not be conveyed into that Bowel, and must therefore be made
in

in it; but how, and of Materials, is a Question to be put at *Delfbos* or *Gresham College*, for *Apollo*, or the *Royal Society* to Answer.

Such Philosophers who call those extraordinary Appearances *Lusus Naturæ*, seem like those of old, who wearied in their Natural Searches by some puzzling Difficulty, take Refuge in Words, ascribing the Cause of Things which they can't discover or discern, to Occult Qualities, &c. If they mean by *Lusus Naturæ*, the Sport or Recreation of Nature, they accuse her who doth nothing in vain, and is the Author of all the Order, Beauty and Benefits we enjoy, as delighting to make Monstrous, Deformed, Useless and Mischievous Things; Things preternatural and contrary to Nature, because destroying its best Works, Man.

If by it they mean that Nature being on the Work of Generation, mistook, failed, or was disappointed; and instead of forming an *Embryo* or *Fœtus*, made a *Chaos*, turn'd into a confus'd Lump of Bone, Fat, Hair and Membranes, the Materials or Elements of Animal Bodies, they greatly err; for in all such Acts of Nature, the Coition of both Sexes is required, according to the old, or either of the new Hypotheses *de Generatione Animal*. which in the Girl of *Deal* was wanting; she being found, upon a very nice and strict Scrutiny of Jealous Eyes, to die a Virgin, and Intact.

We are told by many Authors of the best Credit, That great Quantities of Hair have been found in all the Parts of Humane Bodies, the Fluids not excepted. Dr. *Tyson* did, about twenty Years since, publish a large Collection from them. That Penetrating Eye, beyond the Ken of which scarce any thing in Nature is concealed, reasons like a Philosopher, on the Nature and Production of Hair in Human Bodies, Living or Dead; especially in those Parts we are writing of: but the Teeth and Bones seem too hard, even for so acute an Investigator. He hath indeed
given

given us some very fine Thoughts, and Ingenious Conjectures concerning their Origin and Production; and perhaps he may by this time have discovered more clearly their Causes. If this Paper of mine occasion his divulging those Sentiments, how proud shall I be of the Midwifery!

This is the only Difficulty all those Stories I have told from others are incumbred with; but mine hath another no less hard to resolve. It's obvious how those things were got out of the Women that dyed; but my Patient, who survived the Evacuation, puzzleth me to find the *Ductus per Quem* for such a Lump to pass from without the Womb into the *Vulva*. It was certainly lodged without the *Uterus*; But which way could such a Lump of greasy Hair, with a Bone, and a large Membrane adhering, pass into it? I know none but the *Tuba Fallopiana*; but the Orifice of that into the Womb is so small, that it sometimes wont admit an Egg no bigger than a Corn of Pepper to pass: Whence those Conceptions which are made in that Trunk are occasioned. It will distend very largely, so as to hold a big Foetus; but where it is inserted to the Matrix, the *Foramen* is too narrow for Substances of such Magnitude to pass, unless some very extraordinary Accident expanded it; and what that can be, I can't apprehend.

PHILOSOPHICAL TRANSACTIONS.

For the Months of April, May, and June, 1707.

The CONTENTS.

- I. *Eclipsis Lunaris Tiguri Observata à Joh. Jacobo, & Johanne Schevchzeris, Fratribus, M. D. die 17 Apr. 1707.*
- II. *An Essay on the Invention of Printing, by Mr. John Bagford; with an Account of his Collections for the same, by Mr. Humfrey Wanley, F. R. S. Communicated in two Letters to Dr. Hans Sloane, R. S. Secr.*
- III. *An Account of a Pyramidal Appearance in the Heavens, observed near Upminster in Essex, by the Reverend Mr. William Derham, F. R. S.*
- IV. *An Account of an Experiment, confirming one lately made, touching the Production of Light, by the Effluvia of one Glass falling on another in Motion. By Mr. Fr. Hauksbee, F. R. S.*
- V. *An Account of an Experiment made before the Royal Society at Gresham College, May 28. 1707. Touching the Difficulty of Separating two Hemispheres, upon the injecting of an Atmosphere of Air on their outward Surfaces, without withdrawing the included Air. By Mr. Fr. Hauksbee, F. R. S.*
- VI. *Some Natural Observations made in the Parishes of Kinardsey and Donington in Shropshire, by the Reverend Mr. George Plaxton. Communicated by Mr. Ralph Thoresby, to Dr. Hans Sloane, R. S. Secr.*
- VII. *An Account of the Cape of Good Hope, by Mr. John Maxwell. Communicated by the Reverend Dr. John Harris, F. R. S.*
- VIII. *Epistola, in qua ratio redditur Libri nuper editi, cui Titulus, De Arthritide Anomala, five Interna, Dissertatio. Auctore Guil. Masgravo, M. D. Coll. Med. Lond. & Reg. Societ. Socio.*
- IX. *An Account of a Book, intituled, The Whole Art of Husbandry, &c. By J. M. Esq; F. R. S.*

I. Eclipsis Lunar*is Tiguri Observata a Joh. Jacobo,*
 & Johanne Schevchzeris, *Fratribus,* M. D. *dñe*
 17 Apr. 1707.

H. Min. S.

12 grad 18

18 40

20 15

23

25 20

27 40

29

29 20

29 30

30 30

31 40

33

34

35

36 40

37 20

37 30

37 40

38 40

39 30

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43 40

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45 20

46 30

48 40

51 30

52 40

PEnumbra ex parte Maræotidis.
 Umbra vera intra discum.

Palus Maræotis in Umbra.

Maris Eoi principium.

Mons Alabastrinus. Medium Maris Eoi.

Principium sinus Sirbonii.

Medium sinus Sirbonii, & Mare Ægyptiacum.

Principium insulæ Cercinnæ.

Lacus Meridionalis.

Medium Cercinnæ.

Finis Cercinnæ.

Extrema protensio Montis Sopher.

Insulæ inter Siciliam & Cercinnam.

Principium Mauritaniæ, & sinus Hyperborei.

Medius sinus Hyperboreus.

Mare Pamphilium.

Creta.

Principium Ætnæ.

Medium Ætnæ. Melos. Carpathos.

Finis Ætnæ.

Rhodus.

Initium Sinai.

Medium Maris Adriatici, & Sinai.

Sinai Finis.

Medium Adriatici.

Principium Propont. & Maris Hyperborei.

Medium Propontidis, & finis Adriatici.

Principium Lacus nigri majoris.

H.	Min.	S.	
12	53	10	Lacus Thraſumenus.
	53	30	Medium Lacus nigri minoris.
	54	30	Principium Inſulæ Beſbyci.
	55	10	Principium Ponti Euxini in ſinu Salmydeſſo.
	56		Finis Propontidis.
	57	30	Ponti Euxini inferioris principium.
	58		Byzanzii principium.
	59	10	—— finis.
	59	40	Promontorium Acheruſium.
I	1		Boryſthenis principium. Apollonia.
	1	30	Medium Ponti Euxini.
	3	20	Sinus Athenienſis Medius.
	4	40	Palus Byces.
	5	40	Promontorium Heracleum.
	7	40	Cochilis media. Finis ſinus extremi Ponti.
	8	30	Lacus Corocondæ Medium.
	9	20	Promont. Hercul. & Maris Caſpii initium.
	11	40	Initium Paludis Amadocæ.
	16	20	—— Medium.
	18	10	—— Finis.
	20		Paludes amaræ, & Lacus minor.
	20	40	Lacus major.
	22	10	Tenuiſſimus margo lucidus.
	23	20	Lunæ corpus totum in umbra.
	24	40	Discus Lunæ integer ferè, excepto Mari Mediter. diluto quodam fulgore ſplendet, ut Maria diſtingui poſſint per Tubum.
	40		Alia macula præter paludem Mæotidem per tubum diſtingui nequit.
	45		Lunæ Discus medius magis magiſque obſcuratur, ambitu manente lucidiore.
2	12		Discus Lunæ Rutilo colore nudo oculo refulgebat, nec per Teleſcopium macula ulla diſtingui potuit.
	15		Totus Discus obſcurior magis, & magis, Peripheriâ manente lucidiuſculâ. 2 28

II. Min. S.

2	28	Splendidior Discus è regione Paludis Maræotidis, umbraque densissima versus Paludem Mæotidem.
	33	Sensim lucidior reddit. integer Discus, obscurit. majore tegente Paludem Mæotid. ejusq; loca vicina.
	51 40	Redeunt sensim vestigia Marium.
	56 30	Pontus Euxinus, & Mare Caspium, in mediâ obscuratione manent veluti nebulâ crassâ perfusa.
3	5	Distingui potest Mare Eoum, & vicina, ut ut Luna nondum ex umbra Emerferit.
	9 40	Emerfionis initium verum.
	11 30	Incipit emergere Palus Maræotis.
	13	Evafit.
	15 40	Incipit Mare Eoum.
	21 30	Evafit finis Sirbonius, & Mare Ægyptium.
	26	Evafit Cassioris Regio, & aliquot minuta ante Cercinna insula.
	27 40	Evafit Athos Mons, & Maltha.
	31	Emerfit Mauritania.
	38	———— Corfica, & Sicilia.
	44	———— Mare Adriaticum.
	45 20	———— Media Propontis.
	49	———— Besbycus.
	52	———— Byzanzium.
	57 30	———— Promontorium Acherusium.
4	5 20	Emerfit Pontus Euxinus, & medium Caspium.
	6	Incipit Mæotis Palus.
	9	Emerfit Caspium, & Media Mæotis.
	11 20	Emerfit Mæotis.
	13 40	Penumbra.
	14 20	Luna tota integra.

In Emerfione videbatur mihi umbra distinctior,
quam in Immerfione.

12	18 40	Eclipseos initium in umbra vera.
1	23 20	Obscuratio maxima.
3	9 40	Emerfionis initium.
11	46 30	Duratio totalis obscurationis.
4	14 20	Emerfionis finis.
3	55 50	Tota Duratio.
1	5 40	Ab initio ad Immerfionem Lunæ totalem.
1	5 40	Ab emerfione totalis Eclipseos ad finem.

II. *An Essay on the Invention of Printing, by Mr. John Bagford ; with an Account of his Collections for the same, by Mr. Humtrey Wanley, F.R.S. Communicated in two Letters to Dr. Hans Sloane, R. S. Secr.*

THE Antiquity of Printing, and the first Inventors, hath been treated of by many Authors: I shall now only give a short account of the Observations I have made in many Years from old Books of several sorts and kinds. The general notion of most Authors is, that we had the hint from the *Chineses* ; but I am not in the least inclined to be of that Opinion, for at that time of day we had no knowledge of them. I think we might more probably take it from the Ancient *Romans*, their Medals, Seals, and the Marks or Names at the bottom of their Sacrificing Pots, which Antiquities we had amongst ourselves in *Europe*, rather than fetch it so far. But if it be certain, that Cards are as old as our King *Henry VI.* nothing that I have seen or considered of, seems to give so fair an hint for Printing, as the making of Cards ; as it is evident by the first Specimen of Printing at *Harlem*, and by some Books in the *Bodleian Library* at *Oxford*, one in *Junius's* Collection, another in Archbishop *Land's*, and a third in the same, being the Lives of the *Russian* Saints in a thin Folio ; the Leaves are not pasted together as the former two, but cut on Wooden Blocks, and illuminated. There is also another rare Specimen of the first in that valuable Collection of Archbishop *Parker*, in *Bennet College Library* at *Cambridge*, bound up with a *MS. Book* ; this was shown me at first by Mr. *Bullord*, and differs very much from them at *Oxford* ; it is the *Life of Christ* in Figures

gures, or rather the Types of the Old and New Testament. They have not so many Specimens of the first Printing at *Harlem*, as we have in *England*; and if I can obtain the favour of either University, I will give you a Specimen of two or three, as exact as they are printed: I am apt to believe, that if some curious Persons had the Liberty of looking over the Libraries in both Universities, and that in *Gresham College*, their might be found other Specimens of the Antient Printing; the aforementioned Books being taken notice of but of late.

The Cutting of the Molds or Blocks for making our Playing Cards, is after the same manner as those for the Books printed at *Harlem*. They lay a Sheet of moist or wet Paper on the Form or Block, being first lightly brush'd over with Ink, made of Lamp-black mix'd with Starch and Water: Then they rub it off with a round List with their hand, which is done with great Expedition; this is for Picture or Court Cards: Then they paste them together threefold, the courtest in the middle. They colour them by the help of several *Patterns*, or *Stenciles*, as they call them; they are Card Paper cut thro' with a Penknife, for every Colour, as Red, &c. (for at the first Printing, the Card has only a meer Out-Line :) These Patterns are Painted with Oyl-Colours, to keep them from wearing out with the Brush; they lay it upon the Picture, and by sliding a Brush that is full and loose gently over the Pattern, it fixes the Colour into the cut Holes, and leaves it on the Print that is to be a Card, and so go through all the Colours you see on Cards; but this cannot be so well understood by a Description, as by seeing them perform it. This I humbly conceive to be their way of Printing first at *Harlem*, and those Books abovementioned. This methinks might have been considered before this time of Day, if they would have put themselves to the trouble of inspecting the old MSS. 900 Years old; for the Great Letters are done by the Illuminators the same way

as Card-making; as I shall treat of more at large in another Dissertation.

The next Form of Printing at *Harlem*, was by cutting whole Forms in Wood from MSS. exactly written, and without Pictures : Such I take the *Donatus* to be, mentioned in Histories; and this might bear Date in 1450, some say 1440. This may be as plainly demonstrated, as the former, from Copy-Books which we have seen Printed at *Rome, Venice, Switzerland* and *England*, as high as 1500; and, if I mistake not, there is a Block cut in Box in the Collection of your *Museum* in *Gresham-College*. This writing is harder to perform than either the *Roman, Italick*, or any other Letters used in Printed Books.

The third way of Printing was with single Types made of Wood, but to whom the Honour of the Invention is due, is not very evident; it was then esteemed so great a Rarity that the Printers carry'd their Letters in Bags at their Backs, and got Money at Great Mens Houses by Printing the Names of the Family, Epitaphs, Songs, and other small Pamphlets.

The fourth Improvement of this Noble Art was the Invention of single Types made of Metal. Here we must intirely give the Honour to the never to be forgotten *Peter Scheffer* of *Grenschen*, Servant and afterwards Son-in-Law to *Faust*, who entertain'd him to Work in his House at *Mentz*. He observing how industrious his Master was every Day to improve this Art, undertook it himself; and with much Study and Industry, brought it to Perfection. After he had made several Essays, at last he shews it to his Master *Faust*, who having tried some Experiments with his new invented single Types, finding that it would answer his Expectation, was so transported with Joy, that for his Reward, he promis'd he should Marry his Daughter, a very Beautiful Damsel, whose Name was *Christian*, which sometime after he performed, and continu'd toge-

ther improving this Art with great Secrecy, till it became known, and spread it self over all *Europe*. Sometimes you have their Names to the Books they Printed at the end, and sometimes not; sometimes with Dates as high as the Year 1457, as the Psalms Printed by them, now in the Emperor's Library, which *Lambecius* mentions in his *Bibliotheca*, and as low as the Year 1490; and for this we have the Authority of *Erasmus*, in a Preface to *Livy*, Printed at *Basil* by *Froben*, in 15 . .

As for *John Gattenburgh*, tho' by abundance of Authors he is said to be the first Inventor of Printing, we cannot find one Book with his Name and Printing; but this requires a longer Consideration, which in its due place I shall take notice of.

We may rationally conjecture, that Printing with Plates of Pewter, Brass, or Iron, either Graved or Eat with *Aqua fortis*, was first practis'd by the Working Goldsmiths; for they have a way of taking off the Impressions of their Work, by the Smoak of a Lamp, which, perhaps, gave the Hint to the Graving on Brass. We have a dark Story of it in some Authors, but I shall enlarge upon this Subject.

Having treated of Printing to satisfy the Curious, I shall say something of the several Advances and Improvements it hath received.

The *Harlem* Printing at first was a Book with Pictures; they took off the Impression with a Lift coiled up, as the Card-makers use the same to this day.

But when they came to use single Types, they made use of stronger Paper, with Vellum and Parchment: Then they made use of a Press, altho' they afterwards contrived and made it more useful, as I shall treat of in another place.

Neither was their Ink for Printing brought to Perfection at the first, but improved by degrees.

Rowling-press Printing was not used in *England* till King *James the First*, and then brought from *Antwerp* by our Industrious *John Speed*. I

I shall also discourse at large of the Invention of making Paper in *Europe* from all the best Authors, with large Observations of my own; the time when it began in several Places, more especially in *England*; and I intend to exhibit a Specimen of the Marks of the old Paper, which has not yet been attempted by any.

Bookbinding shall be handled in all its Parts, its several Ages and Times: Also the Form, Size and Volume, Folding, Sewing, Headbanding, several sorts of Boards for Covers, Claspings, Bosling, &c. Also in all Countries, as *China, Persia, Turkey, Greece, Ancient and Modern Germany, Italy, France, Holland and Spain*; but more particularly *England*.

The Devices, *Rebus's*, and Signs of the Ancient Printers will take up a whole Chapter, where their Descent and Genealogies shall be shewn, and how they succeeded one another in their Office, or Printing House. On this Subject I have no Path to follow; but *Draudens* hath a Tract I find mentioned, that treats of the ancient Devices of the Printers, but after my Inquiry, I could never see it, and so can receive no assistance from it. Also *Naudens's* Life of *Lewis the Eleventh* hath an Account of *Faust's* Printing the Bible in the *Latin* Tongue, his bringing them to *Paris*, and vending them there for MSS. his Troubles and Accusations before the Parliament, being tried for a Conjuror, which I conceive gave occasion for that foolish Book, that goes under the Name of *Dr Faustus's* Life. This is not my own thought, but the Sentiments of others, for we have another Example of the like nature for our famous *Roger Bacon*, tho' some Centuries of Years before, who had the like Fate.

Since my second Voyage to *Holland*, to satisfy my Curiosity and remove some Scruples about the Book at *Harlem*, and the Statue of *Coster*, having recollected my self after my first Voyage, and discoursing with Mr. *Talman* Junr. about *Holland* and the Statue of *Coster*; he told me he had
seen

seen the same in *Holland*, and that it was in the *Harlemer-Street* in *Leyden*. This very much run in my mind, to be further satisfied that it should be in *Leyden* and not *Harlem*, altho' asserted by several of our Modern Travelers.

At my last being in *Holland*, for my further satisfaction, tho' I had got Mr. *Ball* to take the Inscription for me the Year before, in *June* 1705, having an opportunity in the Company of my good Friend *Walter Clavel Esq;* on *Wednesday* the 23^d of *October* 1706. we took Boat for *Leyden*, where we arrived about six the same Day, and next Day in the Morning, in the Company of Mr. *Bovell*, a Student there, who was our Guide into the *Harlemer-street*, so called because it leadeth to the *Harlem* Parts, over the Door of a Glazier's House was the Figure of *Coster* cut in Wood, and painted with the Inscription.

This Statue was not set up by any Publick Authority of the Magistrates of that City, but by a Private Man; and, if I mistake not, by the Owner of the House, perhaps for the name and sake of the Street; and, as I suppose, not older than about 1630. This Statue is done after the Graved Print that is in the Book at *Harlem*, or the Painting over the Door of *Laurence Johnson Coster*, where they say he first practis'd the *Art of Printing*, but I rather take it, that he liv'd in this House in his Old Age, and was Church-Keeper, or as we call it, *Sexton*; for so the Word signifies both in the *German* and *Dutch* Language. This afforded me some satisfaction.

Some Days after leaving *Leyden*, in Company of my Friends, Mr. *John Bullord*, and Mr. *John Murray*, we set forth from *Amsterdam* in a Waggon for *Harlem*, to compare and collate the Book which Mr. *Bullord* had procured for me with that at *Harlem*, it being another Impression in *Quarto*. The Name of the Book at the latter end runs thus :

This Book was finished in the good City of Culenburgh, by me John Veldener, in the Year of our Lord 1483, on the Saturday after St. Matthew's Day; with the Device of the Printer hanging on the Bough or Snag of a Tree, a Custom they much used in those Days, as may be seen by the Monuments of the Ancients cut on Grave-Stones, not only in the Great Church at Harlem, but several other Cities in Holland : Which Device I will insert.

The Title of the Book in *Low Dutch*, the Language in which it is Printed, is,

De Spiegel onser Behoudenisse.

In *English*,

The Mirror of our Salvation.

When we arrived at *Harlem*, much to my surprize, we found the House of *Coster* new faced with Plaster, and the Picture of his Statue, (for it is no other than a Picture in Oyl-Colours) painted on a Board let into the Wall near the Top of the House, although it be a small one. This House was new repaired and to be let, altho' when I was there before, it was inhabited by a Cheesemonger. After viewing the House and the Great Church, we directed our way to the Rector, who is the School-master, put in by the Magistrates of the City. He not being in the way, his-Servant Maid took the Key, and readily gave us admission into the Princes Garden, in order to shew us the Book, which was remov'd from the Stair-head of the Prince's *Houffe*, or House, where we saw it last, to the further end of the Garden, in a little House fitted up for that purpose, facing the Garden. On the Chest that it was kept

kept in there was the Date 1618, inlaid in the Wood. Opening it the Maid shewed us the Book, where Mr. *Eullord* collated it with the other we brought with us from *Amsterdam*, and found it to agree both in the words of the Text, and also the Pictures; they only differed in this, that being in Folio, with two Pictures in a Page, and the Words Column-wise, and 25 Lines in a Column, containing 60 Pages, and Printed but on one side, and not pasted together as those at *Oxford* and *Cambridge*.

This will enable me to oblige the Curious with a Specimen of the *Harlem* Book, as well as those of *Oxford* and *Cambridge*, the latter I have cut for my History of Printing, as I do intend the others.

After I had gratified the Maid for her trouble, we addrest our selves to an old Gardener that was at work in the Garden; for Mr. *Bullord* had enquired of him when we came first into the Garden, whether he knew any thing of the Statue of *Coster*, and he readily told him, he could shew him it. At the Entrance into the Garden, at the upper end of the Summer-house, on the Right Hand, he pointed to it, where we saw it leaning with its Left Hand on the Inscription, which bore Date 1440; and in its Right Hand the Letter A in a Square, with other Figures, as little Boys naked, and in their Hands A B C, with the Picture of *Fame* holding the Letters C D and E. This was taken from the Story of *Junius* in his *History of the Low Countries*, and others from him. There are other Stories painted on the Walls of the Summer-House, as one of the Lords of *Harlem* in his Armour; but they not being to my purpose, I shall pass them by.

All these Pictures, with the Statue of *Coster*, are painted in Distemper, and are no older (as appears by the Date on the Ceiling) than 1655.

This is a short Account of my second Voyage into *Holland*, and the Advantages I have gain'd by it, in collating the so much esteem'd Book by the *Hollanders*, which
seems

seems to me not so rare as at first, since I have had a sight of that at *Bennet College* in *Cambridge*, and those at *Oxford*; which will also enable me to give a further Account than hitherto hath been done, by the help of some Books that have been procured me by my Friends Interest, as that of *Naudens* his Story of Printing in the Life of *Lewis XI.* in Mr. *Bayle's* Collection, procured me by Mr. *Leers* of *Amsterdam*, who got the Favour for my Friend Mr. *Bullord*, to Translate that part which relates to the History of Printing, the Story of *Faust*, &c. and the first Printing at *Paris*, as well as at *Mentz*; this contains 16 Sheets in MS. with other Critical Discourse, relating to Learning and Books that were first printed. These I have been in search for many Years, and am apt to believe there is never an one in *England*.

One Book more I want to see, and should be extremely satisfy'd, if any one could procure me the sight of it. It is a small Tract wrote by *Draudius* in small *Twelves*. *The Devices of the Printers.*

I have had the Chronicle of *Collen*, which *Naudens* could never see, and also a Book printed at *Leipswick* in the German Language, giving an Account of the *Jubilee* kept there in Memory of *Printing* and its Invention, Translated into *English* by my Friend and Correspondent Mr. *Bullord*; with many other Tracts relating to the first Invention of *Printing*.

I have spared for no Cost or Pains in procuring of Copies of Books, where they are to be had, for the illustrating it in all its parts to satisfy the Curious. Now as *Printing* it self is but another way of Writing, and brought to perfection by degrees, as other Arts; and as Pictures either painted, cut in Wood, or Graved, were called the Laymens Books; for every one could read a Picture, and say this is an House, and that a Tree; so I may say, that the Pictures, or Drawings of the Ancients,

gave the first hint of *Printing* ; and if the Scribes in process of time had not brought their *Art of Writing* into the Decorum and Uniformity, and Rule in their several Volumes, the *Printers* could not have followed them so exactly in the imitation of their Letters and Pages of their Books. Pictures first were those of Devotion ; then the making of Cards was another introduction to the Invention of *Printing* : The making of Cards I take to be very ancient.

For the first Specimen of *Printing*, was on one side only, as that at *Bennet College*, most in Figures, with some few words only on the side in Labels like that at *Oxford*.

The next Step is that Book at *Harlem* ; the Designs of the Prints are better perform'd, and then they came to have not only Lines, but whole Pages of Words, besides the Pictures on a Page.

The next Step was *Ballad-Printing* with the like Pictures, and them but on one side.

The next Improvement of this Noble Art, was the cutting of whole Pages on Wooden Blocks or Moulds, and Printing on both sides of the Page ; and the first Specimen of this Nature was a *Donatus*, and, as Authors say, was Printed at *Harlem* and at *Mentz*, altho some say a Bible was Printed the same way 1457.

For the History of making Paper here in *Europe*, I have, by the assistance of my Friends in the Tower and elsewhere, been enabled to give a large account of its Antiquity, almost two Centuries higher than I thought of, and shall give the Marks of the Ancient Paper from the 12th Century down to 1600, in the several Countries where the *Paper-makers* lived.

This, I am apt to think, was never attempted by any Author before. The Specimens of Ancient Pieces of MSS. and also of Ancient Paper, collected by my self some Years since,

since, and bound up in 2 Volumes in large Folio, are now to be seen in the Library of his Grace the Archbishop of *Canterbury*, in *St Martin's*, collected and put together at no small cost and pains ; perhaps the first of that kind that ever was done in any part of *Europe*.

I conclude with informing you, that in this Treatise I shall give an Historical Account of the several Versions and Impressions of the *Holy Bible*, *Testament*, *Psalms*, *Primer*, and other Books of Devotion, from the beginning of the *Reformation* down to 1600. At first I had no thought to have inserted them, but some Collections coming into my Hands of late, wherein I find several material Passages not mentioned by any that have gone before me, so amply and fully, as I shall for the Information, and at the Request of my particular Friends, treat of them in a distinct Chapter.

An Account of Mr. Bagford's Collections for his History of Printing, by Mr. Humfrey Wanley, F. R. S.

HIS Collection consists chiefly of *Title-Pages* and other *Fragments* put together into Books, many of them in some sort of Order and Method, and others not. *Ex. gr.*

In one Volume there are Specimens of *Letters* of all sorts, as well of those used in Foreign Countries, as in *England*.

In another are Titles and Fragments of *Almanacks* from A. D. 1537. downwards ; with Titles of *Bibles*, *Law-Books*, &c. Printed by the *Company of Stationers* in *London*.

In other Volumes are the Titles of Books of all Kinds, printed by the *London-Printers*, disposed into some sort of Order, *viz.* as to the Subject of the Book, or Dwelling-place of the *Printer*.

In others are Title-pages of Books printed in *Oxford* and *Cambridge*.

In others, Title-pages of those printed in *Scotland* and *Ireland*.

Title-pages and Frontispieces, with other Specimens of the Works of our *English Engravers*.

Titles of Books printed by *Roman Catholicks*, *Presbyterians*, *Quakers*, by other *Sectaries*, by *Seditious Persons*, &c.

Cuts of *Monuments*, *Tombs*, *Funerals*, &c. in *England*.

Cuts of the same in Foreign Parts, with the Cuts of the manner of *Executing Criminals*.

Cuts with some Drawings of Habits of divers Nations, of several Trades, of *Utensils*, *Weapons*, *Fountains*, or *Wells*, with other Prints useful in *Joyners* and *Masons* Work.

Cuts of Figures in different Postures, as *Writing*, *Reading* and *Meditating* ; with all the *Utensils* used in *Writing*, &c. during some Ages. Cuts of *Schools*. The *Heads* of some *Arithmeticians* ; *Alphabets* ; Specimens of *Knot work*, and some *Great Text* and other Letters. Specimens of *Letter Graving*. *Heads* of *Writing Masters*, *Dutch French*, *English*. Specimens of Letters Engraven in *Small* ; as also of *Short Hand*, &c. *Heads* of *Short Hand Writers*, and Specimens of their Works, and many other things.

Title pages of *Books*, and *Printers Devices* ; Printing in the *Spanish Netherlands*, *Spain* and *Portugal* ; Titles of Books published by *English Catholicks*, *Alphabets* of *Antonin's Capital Letters*, &c.

Title Pages, Alphabets, and Printers Devices, used in Basel, Zurich, and in other Places in Switzerland.

The like for the *United Netherlands.*

The like for *France.*

The like for *Germany*, with some others of *Poland, Switzerland, Denmark, Bohemia, and France.*

The like for *Italy*, with some others of *Geneva, Sicily, &c.*

Collection of *Acts of Parliament, Ordinances, Proclamations, &c. Regulating the Press*; with many other *Papers.*

Proposals for Printing particular Books.

Catalogues of Books, relating to *Painting, Printing, &c.*
Specimens of Paper differently Coloured. *Marks* on the Outfides of Reams of Paper; with *Orders, Cases, Reasons, &c.* relating to the *Manufacture.*

Old *Prints* or *Cuts* from A. D. 1467. with the *Effigies* and *Devices* of many *Printers, Foreigners and English*; with other *Cuts* and Specimens of Paper, &c.

Collection of *Epitaphs* of the *Printers in Basel*; with the *Life of John Froben*; Catalogues of Books, &c.

Collections relating to the *Lives of the Engravers* of divers Countries.

Titles of Books Printed in most Parts of Europe, before the Year 1500.

Collection of *Patents for Printing Law-Books, &c.*

Some *German Cards.*

With many other Volumes of Collections of the Kinds abovementioned, tho' not so well sorted.

And these *Title Pages* of *Books* are really useful, upon many Accounts, viz. as being Authentick and exact, when as in most *Catalogues* the *Titles* are abbreviated and otherwise imperfect. Besides, these *Titles* informed me of many Books I had never heard of before; and from them I have been enabled to enquire for several Books, some of which

which I have since procured to my great satisfaction. And it is my Opinion, that there are but few Curious Men, but upon the View of this Collection, will own they have here met with several *Titles*, or other *Fragments of Books*, in their several ways, which they knew not of before. And thus we see, that a single Leaf of Paper, tho' not valuable in its self; yet when come to be part of a Collection, may be of good use, not only in respect of the *Matter* it Treats of, but as to the *Mark of the Paper, the Date, Printer's Name, Countrey, Title, Faculty, &c.*

Mr. *Bagford* has also a very plentiful Collection of the *Titles of Books Remarkable and Curious*, which he has taken from the Books themselves. And when they are of such sorts, as now are seldom to be seen Entire, he has made such Observations, as that the several Editions shall be certainly known, tho' your Book be Imperfect at Beginning and End.

Mr. *Bagford* also says, that tho' his Collection is not put into exact Order, his Book, or *History of Printing*, shall be drawn up with that Regularity, as shall answer any Gentleman's Desire and Expectation.

Fig: i.

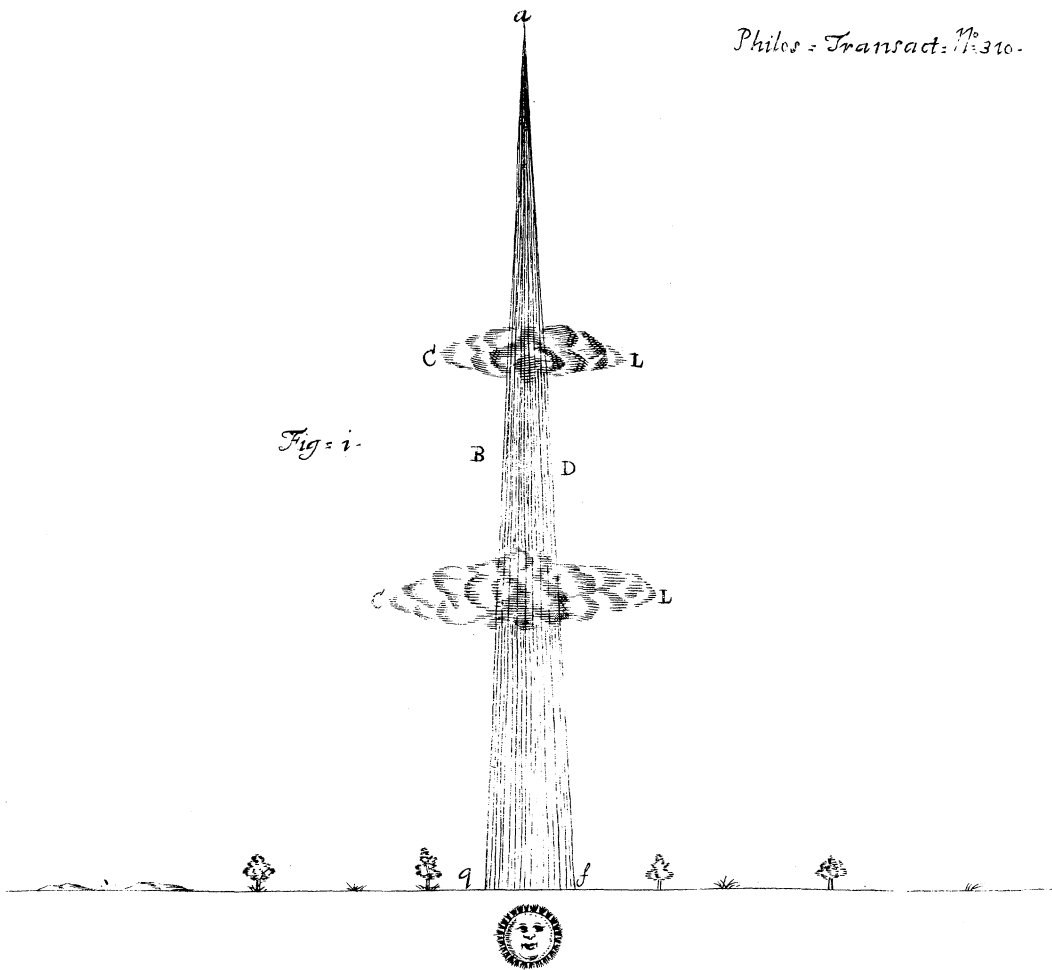
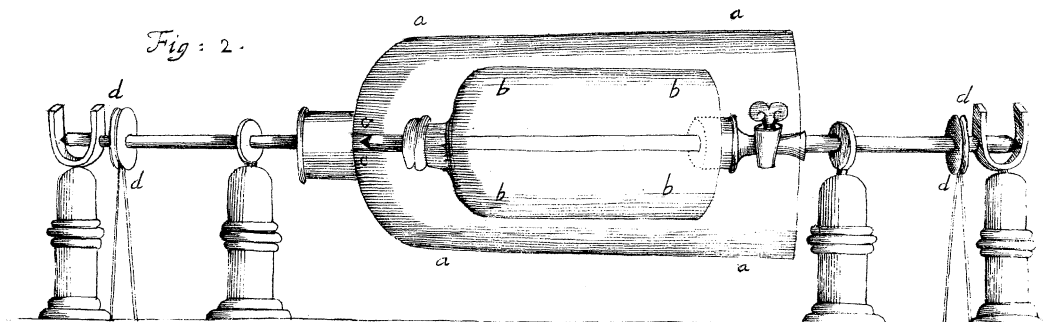


Fig: 2.



III. *An Account of a Pyramidal Appearance in the Heavens, observed near Upminster in Essex, by the Reverend Mr. William Derham, F. R. S.*

Upminster, April 7. 1707.

THE Afternoon of *Thursday April 3.* last, I devoted in some measure to the Service of the *Royal Society*, to take Angles, in order to finish my Observations about Sounds. And as I was returning home, I perceived in the Western part of the Heavens, about a quarter of an Hour after Sun-set, a long slender *Pyramidal Appearance*, perpendicular to the Horizon. The *Base* of this *Pyramid* I judged to be doubtless the Sun (then below the Horizon.) Its *Apex* reacht 15 or 20 Degrees above the Horizon. It was throughout of a rusty red Colour; and when I first saw it, pretty vivid and strong; but the top-part fainter much than the bottom, nearer the Horizon. At what time this Appearance began, whether at, or how soon after Sun-set, I cannot say, being at that time in a Friend's House. But about a quarter of an Hour after Sun-set, as soon as I was gotten abroad, I perceived it, and had for some time a fair Prospect of it, the Horizon being pretty free and open where I then was. But after a while, it grew by degrees weaker and weaker, so that in about a quarter of an Hour after I first saw it, the top-part (*a. b. d.* in *Fig. 1.*) was scarce visible. But the lower part remained vivid much longer, but yet grew by degrees shorter and shorter. I saw the Remains of the lower half (*b. d. e. f.*) a full Hour after Sun-set; and should perhaps have seen it longer, had the Horizon been open. But it was often in my Walk pent up with Trees, which not
only

only obstructed my sight of the end of this unusual Appearance, but also hindered me from an exquisite Observation of all the Particulars that might probably occur.

The whole Atmosphere seemed hazy, and full of Vapours, especially towards the Sun-set. The Moon and Stars were that Evening bearded at that time, and succeeded with an *Halo* about the Moon afterwards. Which disposition of the Air was probably the cause of the Phenomenon. But the Pyramid was undoubtedly imprinted upon the far distant Vapours of the Atmosphere; it being manifestly farther off, or lying beyond some small thin Clouds (*c. l. c. l.*) that intercepted it, and in those parts covered and hid it.

Altho' I have the greatest part of my Life been ready enough to take notice of such Appearances, yet I do not remember I ever saw any thing like it, except the white Pyramidal Glade, which is now entituled by the Name of the *Aurora Borealis*. And it being (except in Colour and Length) so like that, I have thought it worth your cognizance, and, if you think fit, of our most illustrious and famous Society also; because it may perchance in some measure conduce to the Solution of that odd Phenomenon, the *Aurora Borealis*.

I was just going to give you some of my Observations about the Migration of Birds this Year, which makes me hope, that that Subject is within the reach of the *Royal Society* to discover. But being prevented, I have not time just now, but shall reserve it for a more convenient Opportunity, when I have more leisure.

I have searched every Night since for this *Pyramis Vespertina*, but have not seen any such Appearance, although the next Evening was hazy and likely. I also looked out to see whether the *Aurora Borealis* would succeed in the room thereof, but discovered no such thing.

Fig: i.

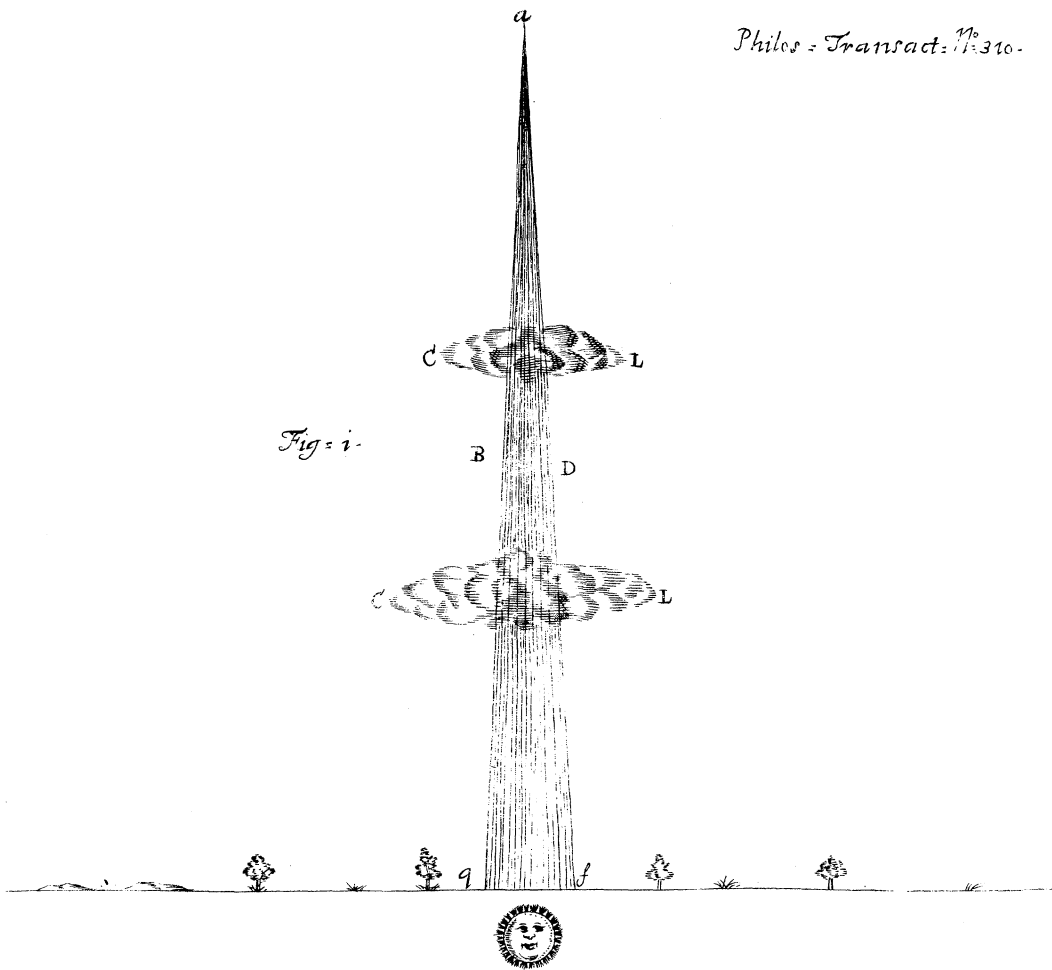
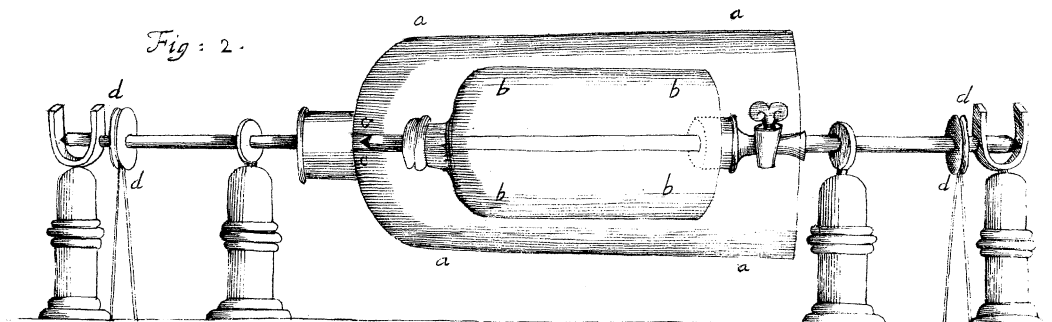


Fig: 2.



IV. *An Account of an Experiment, confirming one lately made, touching the Production of Light, by the Effluvia of one Glass falling on another in Motion.*
By Mr. Fr. Hauksbee, F. R. S.

HAVING observ'd that the *Effluvia* of Glasses were capable of Exhibiting a *Phænomenon* falling on an Exhausted Glass in Motion, as if rub'd by a visible Solid Body, (as I lately shew'd before this *Honourable Society*;) I thought a farther Confirmation of the same, would not be unacceptable. In order thereunto, I devis'd the following Experiment.

I took a large Receiver in form of *Fig. 2. a. a. a. a.* Within the Body of which, I fixt another in manner and likeness of *b. b. b. b.* their *Axis* lying parallel to the Horizon, and were fixt one within another at *c. c.* The outward surface of the inward Glass was at least an Inch distant from the inward surface of the outward one; and were turn'd by two large Wheels, whose Bands related to the small Wheels *d. d. d. d.* fix'd on their *Axis*. The inward Glass was first Exhausted of its Air; then being fixt, as before describ'd, I order'd that Wheel only to be mov'd, which gave Motion to the great Glass; thinking that when the *Effluvia* of that Glass, by the Application of my Hand upon it, should reach the other, notwithstanding it was at rest, it would nevertheless be affected by it and give a Light; which accordingly fell out as I expected, spreading its self in flying Branches all over. Then causing the other Wheel to be turn'd, the

Light became more considerable ; and, I think, the greatest as yet that has been produc'd in any Experiment made on this Subject ; and doubt not, but would have been more so, had the inward Glass fitted nearly to touch the inward Surface of the outward one ; the *Effluvia* of which, (as it seems to me) would then be capable to act with more Vigour on the Exhausted moving Receiver. But to return : I caus'd both the great Wheels to give Motion to the Glasses one and the same way, with as equal a Velocity as they could ; yet I did not discover but the Light was then as strong, and continuing, as when their Motions were made Reverse : So that I do not perceive that a Disenting Motion from each other does any way contribute to the *Phænomenon* ; but Motion it self, without being prescrib'd by Rules, (as this Experiment seems to insinuate) is found absolutely necessary, as indeed the whole Course of Experiments on this Head abundantly confirm. I farther observe, that notwithstanding the *Effluvia* seem'd to be equally distributed on the outward Surface of the inward moving Glass, yet the Light was most vigorously apparent on that side of it nearest the Attrition : And when the Motion of the outward Glass was ceas'd, or the inward one, and the other in Motion, (for upon trial I found very little Difference either way,) the Light would continue to appear a considerable time within the Exhausted Glass, till the *Effluvia* of the other, were no longer capable to act with so much strength, as to lay hold or affect the inward one. I likewise observ'd, that after both Glasses had been in motion for some time, and the Hand apply'd all the while on the outward one, that then the Motions ceasing, and no Light appearing, it was but approaching my Hand near the Surface of the outward Glass to produce Flashes of Light like Lightning in the inward one, the *Effluvia* seeming then to be more vigorously pusht upon it by the approaching Hand. Now
how

how these *Effluvia* of Glafs become capable to Act or Perform the Office of a Solid Body, or why fuch a *Medium* is requir'd in the inward Glafs to produce the Light, I think are worthy the Confideration of this Society. For I have try'd, that upon letting in a little Air, the Appearance of it dy'd, nor could it then be recover'd in that ftate altho' diligently endeavour'd.

V. *An Account of an Experiment made before the Royal Society at Gresham College, May 28. 1707. Touching the Difficulty of Separating two Hemispheres, upon the injecting of an Atmosphere of Air on their outward Surfaces, without withdrawing the included Air. By Mr. Fr. Hauksbee, F. R. S.*

Since the greateft Satisfaction and Demonstration that can be given for the Credit of any Hypothefis, is, That the Experiments made to prove the fame, agree with it in all Refpects, without force : As in that of Sound, the Air is prov'd the proper Vehicle to communicate it, not only by its leffening according to the degrees of Rarification ; but by its increafing according to the Degrees of Condensation. Now altho the Preffure of the Air is evident by a number of Undeniable Experiments made by the Air Pump ; Yet the feveral Phænomena of which being liable to be accounted for by the *Suctionifts*, and *Funicularians*, to proceed from fome (unintelligible) Internal Caufe ; therefore to put the Matter of Fact (I think) paft all Difpute, I devis'd the following Experiment.

I took a strong Glass Receiver, open and arm'd with Brass Hoops at top and Bottom: To which parts were apply'd two Brass Plates with wet Leathers between them, but first were included two Brass Hemispheres which joyn'd on a wet Leather, their Diameter was 3 Inches and half. A Mercurial Gage was likewise included. To the upper Hemisphere was screw'd a large Brass Wire, which pass'd thro' a Box of Leathers that was screw'd on the Upper Plate, and could easily be mov'd up and down without suffering any Air to pass with it. To the upper part of this Slip-Wire was screw'd a Cock, thro' which the Air was to be Injected. In this manner the lower and upper Plate were screw'd strongly to the Receiver; into which, after an Atmosphere of Air had been thrown, (which was easily discoverable by the Gage, the Air in which possessing but half the space it did before,) the Syring was taken off, and an Iron with an Eye was screw'd on in its Place, by which the whole *Apparatus* was suspended on a Triangle. To this Iron related the Slip-Wire and Upper Hemisphere; All the rest being part of the weight made use of to separate them. Then into the Scale, which hung at its bottom, was put in so much Weight as, with its Aggregate, amounted to full 140 Pound, before the Hemispheres could be parted: The Friction of the Slip-Wire thro' the Box of Leathers was very inconsiderable. Now how those Gentlemen, who account for the Ottoegerick Experiment by Suction, or the Funicular Power, how, I say, will their Hypothesis Answer for this, which is only the Reverse of it, (there being no room left to apply either, the Air within the Hemispheres remaining in its natural State) I cannot tell; but think they must abandon their Reason to deny the Doctrine of the Airs Pressure, after so convincing an Experiment as this, which not only most strongly confirms and establishes the same, but leaves no manner of Umbrage for any other Hypothesis to take place in it.

P O S T S C R I P T.

I have since repeated the same Experiment with the like Success as before. And to try how agreeable it would answer all manner of ways, I caus'd the same two Hemispheres to be exhausted of their Air, and then found that the like weight was requir'd for their Separation, as when the additional Atmosphere of Air was thrown on their outward Surfaces without withdrawing the included. And farther to confirm the same, I not only caus'd the inward Air to be withdrawn from the Hemispheres, but then being included within the Receiver, I likewise caus'd the same Quantity of Air to be injected on their outward Surfaces, as in the former *Experiment*, and then found that 280 l. (which was double the weight before requir'd) did not separate them. I was unwilling to add more (tho' I knew a small Addition must have done it) fearing the breaking some of the weaker parts, which I thought were in danger by the fall of such a Weight: The Experiment being apparent and satisfactory without it.

VI. *Some Natural Observations made in the Parishes of Kinardley and Donington in Shropshire, by the Reverend Mr. George Plaxton. Communicated by Mr. Ralph Thoresby, to Dr. Hans Sloane, R. S. Secr.*

S I R,

YOU have oftentimes desired me to give you an Account of such Observations as I had made in my Parishes in *Shropshire*, and in some of the neighbouring Villages ; my poor Remarks are hardly worth your notice, however to shew you that I cannot deny you any thing, I now send them, or some part of them.

Anno 1673, I was presented to the Vicarage of *Sheriffes-Hales*, and also to the Rectory of *Kinnardsey*, the former in the Counties of *Salop* and *Staff*. The other wholly in *Shropshire*. *November 6*. I was inducted into the Parsonage of *Kinnardsey*, where I was incumbent for 30 Years and upwards ; at my Induction I found a great many Aged People in the Parish, upon which I took the Number of the Inhabitants, and found that every sixth Soul was Sixty Years of Age, and upwards, some were 85 and some 90 ; this I could not but wonder at, considering that the Town was surrounded with a large Morass, overflowed in Winter, and that you could not come into the Parish any way upon Arable Land. At my Entrance there, I found neither Gentleman nor Begger, nor any sort of Disfenter from the Church ; there had been no Law Suit amongst them in the Memory of Man, nor was any commenced

menced during my Incumbency as Rector there, for above Thirty Years together ; they have but *one way to the Town and Parish*, the rest they hire from Lords of the adjacent Manours. The *Morasses* or *Moors* are of a great extent, and the Parish was surrounded with them, the Village was called *Kinnardsey* or *Kinnardus his Island* ; *ei, ea, ey*, all these are Watry Terminations : Thus the next Parish was *Eyton*, the Town upon the Waters, *Edney*, or *Edwyney*, *Edwin's Island*, *Buttery*, or *Butterey*, the Island of Butter, being a long Grazing Tract of Land, with some others of the like ending. All that vast Morass was called, the *Weald-Moor*, or the Wild Moor, that is, the Woody Moor : Thus the *Wood Lands* of *Kent* are called the *Weald* of *Kent* ; the *Wolds* of *Yorkshire* most probably have been Woody formerly, and called the *Wealds*, for the Word *Weald* or *Wold* is by our *Saxon* Masters render'd *Woody* ; and I have been assured from Aged people, that all the Wild Moors were formerly so far overgrown by Rubbish Wood, such as Alders, Willoughs, Salleys, Thorns, and the like, that the Inhabitants commonly hang'd Bells about the Necks of their Cows, that they might the more easily find them. These Moors seem to be nothing else but a Composition of such Sludge and Refuse as the Floods left upon the Surface of the Ground, when they drain'd away, and yet this Sediment is full three or four Foot thick ; for I have often observed, that the Black Soil cast up by Moles, or digged out of the Ditches, was a meer Composition of Roots, Leaves, Fibres, Spray of Wood, such as the Water had brought and left behind it ; in Digging they often find Roots and Stumps of Oaks three or four Foot under the Surface, and they are very common in the bottom of their Ditches and Drains : The Soil is peaty, and cut up for Fuel in some part of the Lordship ; in the bottom of these Peat Pits, they find Clay, Sand, and other sorts of Earth. These Grounds have

have been formerly much higher, for I have observed Oaks and other Trees, where the present Soyl is so much shrunk and settled from them, that they stand upon high Stilts, and are supported from the great Fibres of the Roots, so that Sheep may easily creep under them.

That great Tract, called formerly *Vasta Regalis*, is now by Draining become good Pasturage, and yields my Lord Gower, the Owner of it, a considerable Rent, his Ancestors having purchased the Royalty from one of the Earls of *Shrewsbury*: It yields great Quantities of Hay, tho much of it is of such a nature, that it will dry up a new Milch-Cow, starve an Horse, yet will it feed an Oxe to admiration; and I have heard some Grasers say, they could not by their best Upland Hay feed an Oxe so fat, as the Moor-Hay would do; this, I suppose proceeded from its dry and binding Quality that made the Oxen drink much.

One thing I must further observe to you, within the Parish, about half a Mile from the Church, there is a pretty Farm call'd *The Wall*, which I judge was formerly a *British Fortification*; 'tis encompassed with a Morass, and raised up from Sand, broken Stones, Gravel, and Rubbish to a great height and breadth, being (as I measured it) above 1900 Yards in Compass, and 16, 18, and 20 Yards in Breath: In some places it seems to have been Built before the Moors became Boggy, for I could never find any way over the Moors, by which they could carry those vast Quantities of Earth, Clay, Sand and Rubbish to raise that mighty Rampire. In that Parish I was the *Sixth Rector* from the Days of *Henry VIII*.

As to my Rectory of *Donington*, to which I was presented *Anno 1690*. I found there as many *Old People* as I did at *Kinnardsey*, nay, I may say more; and in the two Parishes I had but a difference of three in the Number of the People; at *Kinnardsey* I had 135 Souls, at *Donington*

138 ; of the 135 I had 23 Aged 60 and upwards, of the 138, 24 ; both which Numbers Multiplied by 6, the one at *Kinnardsfey* was 138, the other at *Donington* would have been 144. I had nothing very remarkable at *Donington*, save the *Royal Oak*, which stood at *Boscobell* within the Parish, and the Owners thereof paid 6 s. 6 d. yearly, in lieu of their Tythes and Offerings : The *Royal Oak* was a fair spread thriving Tree, the Boughs of it were all lined and covered with Ivy ; here in the Thick of these Boughs the King sate in the Day-time with Colonel *Carlos*, and in the Night lodged in *Boscobel-House*, so that they are strangely mistaken, who judged it an old hollow Oak, whereas it was a gay and flourishing Tree, surrounded with a great many more ; and as I remember in Mr. *Evelyn's* History of Medals, you have one of King *James I.* or King *Charles I.* where there is a fine spread Oak with this Epigraph, *Seris Nepotibus Umbra* ; which I leave to your Thoughts.

The People here live to *great Ages* ; I saw in one House three Healthful People, whose Ages numbred together made 278, and I think they lived some Years after ; they were the Man and his Wife, and his Wife's Brother.

I was at *Donington* about 13 Years and some Months ; in all that time I Buried but 27 People, of which Number 4 came from Neighbouring Parishes, 4 were Young ones, and of the remaining 19 the youngest was about 60, and the eldest 96 Years of Age. I was there the fourth Legal Incumbent in Succession from the *Reformation* ; and as I remember at one Triennial Visitation of the Bishop, we had neither Burial or Wedding to return into the Registry at *Litchfield* : The Country is very Healthful in those Parts, and tho it seems to the Eye of a Traveller to be but of a moderate height, yet in riding between *Donington* and *Wolver-Hampton*, which is but five Miles, you cross four Rills or Brooks in the Compass of three

Miles, two of which run into the South-West Seas, viz. to *Severn* and *Bristol*, the other two hasten to *Trent* and *Humber*, and so into the Northern Ocean.

The Poor Remains of the *Royal Oak* are now fenced in by an handsome Brick-Wall, at the Charge of *Bazil Fitz-Herbert* Esquire, with this Inscription over the Gate, (upon a Blue Stone) in Golden Letters.

*Fœlicissimam Arborem quam in Asylum
Potentissimi Regis Caroli Secundi Deus Opt. Max.
per quem Reges regnant, hic crescere
voluit, tam in perpetuam rei tantæ
Memoriam, quam in Specimen Firmæ
in Reges fidei, Muro cinctam
Posteris Commendant, Bazillius
& Jana Fitz Herbert.
Querus Amica J. vi.*

'Twas put up about Twenty or Thirty Years ago, but the Place deserved a Nobler Memorial ; I have writ it in such Lines as they have cut it, and as the Letters now stand ; a few Years will ruine both the Wall and the Inscription.

The Emblematick Medal my good Friend alludes to, is the XLVIth in Mr. *Evelyn's Numismata*, which King *Charles I.* caused to be stamped in honour of the Installation of his Son, whereupon is the *Royal Oak* under a Prince's Coronet, overspreading Subnaſcent Trees and young Suckers.

SERIS. FACTURA. NEPOTIBUS. UMBRAM.

Reverse within the Garter of the Order is this Legend.

CAROL. M. B. REGIS. FILIUS. CAROL. PRINC.
INAUGURATUR. XXII. MAII. MDCXXXIIX.

The Inscription at *Boscobel* reminds me of one I had from the late Reverend Mr. *Illingsworth*, President of *Emanuel* College in *Cambridge*, which was Inscribed upon a Pillar erected by the Sea side.

*Siste, viator, iter, vestigia prima secundus
Posuit hic Carolus, quum redit exilio.*

VII. *An Account of the Cape of Good Hope, by
Mr. John Maxwell : Communicated by the Reve-
rend Dr. John Harris, F. R. S.*

THE *Cape of Good Hope*, which is part of *Monomotapa*, and the Southernmost part of *Africa*, lies in the Latitude of 34 Degrees 30 Minutes South, and 16 Degrees 15 Minutes East of *London*. It was first, that we know of, discovered by *Bartholomew Diaz*, A. D. 1493, under *John II.* King of *Portugal*. He gave it the Name of the *Cape of Tempests*, because of the Storms he met with there, with which 'tis not strange that it is sometimes troubled ; as likewise with a Sea that runs very high, and makes it ill riding at Anchor there when the Wind is at North-West, seeing it is a Shread of Land stretch'd out into a vast Ocean on each side ; but King *John* gave it the Name of *Bona Esperanca*, or of *Good Hope*, which it still retains ;

because that when that Cape was doubled, he had good hopes of finding out a way by Sea to the *East Indies*, about which he was then very solicitous.

The *Hottentots*, Natives of this Place, are a Race of Men distinct both from *Negroes* and *European Whites*, for their Hair is Woolly, Short and Frizled, their Noses flat, and their Lips thick, but their Skin is naturally as White as ours, as appear'd by a *Hottentot* Child brought up by the *Dutch* in their Fort here. Their Stature is universally of a middle Size ; they are clean limb'd, well proportion'd, and very nimble. I never saw a Fat Person among them.

They besmear their Faces and Bodies all over with Suet, or other Oleaginous Stuff, which, together with exposing their Bodies to a warm Sun, makes their Skin of a Tawny Colour, and causes them to stink so, that one may smell 'em at a considerable distance to the Windward ; they adorn their Hair, which is always clotted with Grease and nastiness like the Thrums of a Mop, with Shells, peices of Copper, &c. Both Sexes are clad with the Skin commonly of a Sheep, but sometimes of such Wild Beasts as they happen to kill, the Hairy side outward in Summer, and inward in Winter, off which I have seen 'em pick and eat the Lice in the Streets : The Women wear Skins cut in Thongs about their Legs, to the length of a great many Yards ; which when dry. with the inside out, look so like Sheeps Guts, that most Strangers mistake 'em for such. The Men hang their Privities in a Bag, and the Women cover theirs with a Flap or Apron made of Skin. The Women wear a Cap of Skin just dried and stitch'd together, whereas the Men commonly go bareheaded ; they go bare-footed, except that when they Travel they wear a piece of a Skin fasten'd about their Feet. Their Weapons are Javelins, with which they are very dextrous at hitting the Mark, and Bows with Poyson'd Arrows, which

which kill, as I am inform'd, upon drawing Blood, but what they are envenom'd with I could not learn : their Houses are Hemispherical, made of Mats, supported with Stakes, so low that a Tall Man cannot stand upright in one of them ; These they remove upon occasion, as the Ancient *Nomades* did their Tents.

By all that I have seen and heard of them and other Nations, they are the most Lazy and Ignorant part of Mankind ; by virtue of which two most excellent Qualifications, there are no manner of Arts practis'd among them, no Plowing or Sowing, no going to Sea in so much as a Boat, no use of Iron or Money, no Notion of God, Providence, or of a future State, no Tradition of Creation or a Flood, no Prayers or Sacrifices, no Magical Rites ; nor, in fine, any Notion of any Invisible Being capable of doing them either good or harm, upon the strictest Enquiry that I could make of Men of Sense that had liv'd some time upon the Place ; so that I believe their Ignorance hardly can be parallel'd : The only thing that looks like the least knowledge of any thing of this kind among 'em (in as much as I could learn) is a Custom they have in Moonshiny Nights of Dancing in the Fields, of which, if you ask 'em the reason, all their Answer is, that it is a Custom of the *Hottentots*, and was so of their Forfathers ; and that is all they can tell you of the matter ; now whether it be that they rejoyce in its Light, which dispels that darkness of which they are then most sensible, or whether they think it a Rational Being endued with freedom of Will, because of its various change of Forms, or for what other reason I will not pretend to determine ; however as to no other thing, so neither to this do they Pray or Sacrifice : Nevertheless some Voyagers have upon this ground, how truly I will not say, confidently writ, that they worship'd the Moon ; and upon Enquiry I could not find that they took so much, nor
indeed

indeed any such notice of the Sun or Stars ; which former at least one would think a People so grossly ignorant would pay some respect to, if they worship'd any God, that being the most Glorious Object of their Senses ; and accordingly we find it affected all Heathen Nations, as well the more Barbarous as the most Polite ; in which single Object, if we may believe *Macrobius*, all their Worshiping center'd : Their great Ignorance, I suppose, may be in part caus'd by *Africa's* being Peopl'd (as is probable) by that end of it which joyns to *Asia* ; so that the more the Inhabitants spread themselves towards this Southern Extream, the more they were cut off from conversing with the more Civiliz'd part of the World ; it is probable, I think, that they were propagated to this Place by the Eastern Coast of *Africa*, the Western being now, and always having been, as far as we know, inhabited by *Negroes*, from whom it is not very probable, that these of so different a Colour should have sprung.

All the Resemblance they have of Government is, that in every Neighbourhood the Eldest is first in Order and Dignity ; his Advice as to what concerns the whole being most follow'd, as having most Experience. The Ceremony of Marriage is perform'd among them by the Eldest Person in the Company's sprinkling the Persons to be Married with his Urine, upon which, and cutting out one of the Man's Testicles, the Business is over ; this several that lived in the Place affirm'd to me for a certain trnth. Being inquisitive to know the truth of this, I had the Curiosity to search several of 'em, (who will readily suffer you for a double Stiver to do it) in two of which I could find but one Testicle, they (I suppose) being Marry'd, as the rest who had two were not ; which however shews the mistake of *Nienhoff* and others, who assert, That the *Hottentots* cut out one of the Testicles of all their Male Children as soon as they are born (accord-

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ing to *Nienhoff*,) or at the Age of nine or ten Years (according to others,) and that, forsooth, to make 'em the more swift and nimble; but how that fancy should come into their Heads, I cannot tell. When a Woman bears Twins among them, she exposes one to Death by Hunger or Cold, and nurses the other; the Reason of which two last Customs is alledg'd by some, how truly I know not, to be the fear they have of their Nations growing too numerous: The Custom of revenging, rather than punishing Adultery with Death, has prevail'd among them. I was inform'd there, that they abhorr'd *Polygamy*, tho' some Writers have asserted the contrary, but (perhaps) they are as well mistaken in that, as in the Semicastration of all their Males. When any Person grows decrepid with Age, their Children, or nearest Relations, shut 'em up in their Houses, and starve 'em to Death. They Bury their Dead with the Skins they wore when alive about them.

Their Food is for the most part Roots, but chiefly one by the *Dutch* call'd *Ontee*, which is roundish, about the bigness of ones little Finger, and hot in the Mouth; their Drink is Milk and Water; when they kill a Sheep, or a Cow, they Eat the Guts and Garbidge, either slightly broil'd or quite raw; they are great Lovers of *Tobacco* and *Brandy*, to purchase which from the *Dutch*, is all the use they have of Money. They are not *Cannibals*.

There was a *Hottentot*, who had liv'd for some considerable time in *Holland* and the *East Indies*, and had learned to speak *Dutch* and *Portuguese* very well, whom, upon his return home, his Wife, Children, or Friends, could not endure, nor would they converse with him, till upon resuming his Ancient Habit, Diet, and Customs, he had returned to their way of Living.

Notwithstanding their great Ignorance, they distinguish several of the more remarkable Stars by Names of their
own

own impoling : Nevertheless they have no distinction of Weeks, of Months, or of Years, any otherwise than by their *Rainy Seasons* (of which afterward ;) for if you ask a *Hottentot* how Old he is, he answers, so many *Rains*. They watch the *Elephants* where they use to Water, whom they shoot, in the Eye, where only they can wound 'em.

This Country produces Lyons, Tygers, Elephants, Rhinocerots, Elks (whose Hoofs here are said not to have that Virtue ascrib'd to 'em in Northern Climates,) Leopards, Wild Asses, of which one sort is finely streak'd with White and dark Brown ; several sorts of Beautiful Wild Goats, Jackals, Baboons, Monkeys, Deer, large Cows, and large Sheep without *Horns*, with *Hair* like a Goat, instead of *Wool*, and with large *Tails*, but not (in as much as I have seen) so large as some report 'em, *viz.* of 25 *l.* weight, (the Flesh however of both which is very good ;) small Horses, &c. Ostriches, Pellicans; Hawks, Magpies, Wild Peacocks, Cranes, Guiney Hens, Pengwins, Flemingo's, Rock Ducks, Partridges, Pheasants, Geese, common Hens, Turkeys, and Ducks, &c. Here are likewise Manatees or Sea Cows, they are low, very thick and ill shap'd, have very short Feet, and yet are very swift, have no Hair but what grows about their Nostrils, have large Teeth, but are no Enemy to Man; they are not easily wounded, live much in Rivers, and are very shy. Here are Serpents of various kinds, with which however they are not much infested. Their Soil produces most sorts of Fruits and Plants that grow with us, as Grapes of several kinds, Apples, Quinces, Olives, Oranges, Apricots, Cherries, Aloes of great many kinds, but none (that I saw) of the right sort, such as *Socotra* produces, Pompions in abundance, Cabbages, &c. Corn, as Wheat, Barley, &c. of *Dutch* Cultivation. Here are likewise Lizards, Salamanders and Porcupines. This place
is

is fit to produce whatsoever is planted in it, the Soil and Climate conspiring to its Advantage.

The *Dutch East-India Company* are said to have bought this Place of the Natives; but seeing they have no Government, to whom in that case could they apply themselves? Or of whom could they buy it? But if they did, they certainly had a good Bargain of it for a little Tobacco and Brandy: But the *Dutch*, who are no better than their Neighbours, are not so very scrupulous as to trouble themselves much about buying, in such cases, what they can take by force. Here however they have settled for the convenience of a Rendezvous for their homeward bound *East India Fleet*; and they have possessed themselves of the Country 60 Miles from the Place of their first Settlement: Beside their principal Town in *Table Valley* (so call'd from a neighbouring Hill, call'd *The Table Land*, because of it's Figure, from whence also the adjoining Bay is call'd *Table Bay*) where they have a Fort, an Hospital, a supplied Church with about 300 Families; they have two other small Towns in the Country, call'd *Dragenstein* and *Stallambufs*, inhabited for the most part by *French Protestants*, who make most of the Wine the Place produces, which is not inconsiderable, either for Quantity, Quality or Variety, resembling *French Claret*, *Rhenish*, *Burgundy*, &c. they are about 120 Families, and have one Minister between both Villages, a *Dutchman* who speaks *French*.

In this place are reckon'd about 2000 Persons fit to bear Arms, and about 600 Soldiers; no Person that is not in their own Service, tho' a *Dutchman*, is admitted into their Fort. They have prohibited the *English* to set up among them, tho' they have served the usual time of five Years in their Service, which Liberty they deny not to those of any other Nation; and this, I am inform'd, is their practise in all their *East India Settlements*: However when any *English Ship* happens to touch here disabled in

Masts, Rigging, Anchors, &c. they supply 'em for their Money out of their Stores.

Instead of Customs and Excise, they use Monopolies; for the Monopolies of Wine of the Growth of the Place this Year 1706, was paid 39000 Gilders; imported Brandy 3000, and so of the rest.

All the Publick Payments they make, are either for the Watch, or for killing of Lyons, 20 Dollars Reward being given for killing a Lyon, and 10 for a Tyger; the latter they Hunt, but the former they only dare attempt by Stratagem, whom they thus destroy: When a Lyon in the Night time gets among their Cattle, he commonly kills more than he eats at that time, whether he seldom fails to return the next Night to eat up the rest; but before he comes, they take care to set Snares about the Prey with Musquets so dispos'd, that in coming at it, he must of necessity draw the Trickers, the Muzzles being so planted, as that they seldom miss him; but if he be not kill'd out right, the poor Musquets are sure to feel his Fury, for he gnaws the Stocks, and imprints the marks of his Teeth in the very Iron; and tho' they are able to go away, there they are known to watch for two or three days to see who comes to look after the Execution, whom they set upon if they be not well aware.

A sort of Pilgrims in the *East Indies*, whom they call *Fouquiers*, and who often have occasion to Travel thro' Deserts, have a strange dexterity in killing these Wild Beasts; for when he sees one of them making towards him, he faces him, kneeling on one Knee, and holds towards him a short Spear in his Left Hand, upon which, the Beast making a Leap at him, pitches and fixes his body, and then he runs down his Throat a Ponyard which he carries in his Walking-Staff, and so kills him. I had the following, concerning a Tyger, from an Eye Witness.

The

The *Colchester*, an *English East India* Man, was at that time in *Rogues River* in *Bengal*; it was Night when several of the Ships Company happen'd to be alhoar in a Tent they had pitch'd to be merry in : Mr. *Ravenscraft* the Second-Mate had just put on a clean Shirt, he happen'd to be the farthest in the Company from the Door, with his Face opposite to it, when a Tyger rushed in among them, seiz'd him and carried him off in spight of them without having so much as a squeek for his Life : I suppose the glaring of the White Shirt, affecting the Tygre the most sensibly of the Objects that were before him, made him fix upon him rather than the rest ; the next day, upon search, they found some Remnants of his Body in an adjacent Wood. When a Tyger leaps at a Man, if his first Aim be avoided, he never, as they say, makes a second Attempt.

The Winds which blow at the *Cape of Good Hope*, are of that kind which are call'd *Monsoons*; for between the beginnings of *March* and *September*, (which is their Winter) the Wind blows for the most part between the North and the West, during which time they have not much fair Weather, from which Rainy Season the *Hottentots* compute their Year ; but during the other half Year, the Wind generally blows between the South and the East, accompanied with very fair Weather : There oftentimes comes down from the Neighbouring Hills most sudden and violent Gusts of Wind upon the Neighbouring Parts.

The Companies Garden, which is about 970 of my Paces long, and 230 broad, is not now in that fine order it was in during this Governour's Father's time, when it was divided into four parts, in each grew abundance of the more remarkable Vegetables belonging to its corresponding Quarter of the World ; but tho' the Climate, Soil and Situation are very favourable, 'tis now much

neglected both in respect of it's Plants and Walks, neither of which are extraordinary.

I met here with one *Tennis Gerbrantzen*, Master of a *Dutch Ship*, who in the Year 1690, was at *Terra di Natal* on the Eastern Coast of *Africa*, in the Latitude of 30 Degrees South, distant from the *Cape of Good Hope* about 800 Miles, where he said he bought the Place for the *Dutch East India Company*, for 20000 Florins. Coasting thence to the *Cape of Good Hope*, his Ship was cast away, but they all got safe ashore, who to the number of 18, set out by Land for the Cape distant about 200 Miles, where only four of them arriv'd, all the rest dying by the way, through extremity of Hunger, Thirst or Heat, except two or three that were kill'd by the *Hottentots*; they met with no Wild Beasts by the way, Elephants excepted, whom they saw in great Numbers. In Year 1705. *Gerbrantzen* went again to *Terra di Natal*, the late King's Son then reigning, to whom he spake of the former Agreement with his Father: *My Father*, answers he, *is dead, his Skins (i.e. Cloaths) are Buried with him in the Floor of his House, which is Burn'd over him, and the place is fenced in, over which none now must pass; and as to what he agreed to, it was for himself, I have nothing to say to it.* So *Gerbrantzen* urg'd it no farther, having no Orders concerning it from the Company. At his last being there, he met with an *English Man* who was left there *A. D.* 1698; he had two *Hottentot* Wives, and Children by 'em, but would not return with him to *Europe*, lest his Wives and Children should be slain in his Absence.

When I was at the *Cape of Good Hope*, I met with one *Mr. Kolbe*, who was sent thither by a *Prussian Lord*, the *Baron Krosick*, who likewise sent another to the Northward, each of 'em to take Observations, especially of Cœlestial Phænomena, for the improving, Astronomy, and Natural Philosophy; but Astronomy and Natural
Philosophy

Philosophy will not, I believe, be much improv'd by this Mission. This Gentleman told me, That the common Salt there made use of by the *Dutch*, was left in hollow Places of the Earth's Surface, after the Sun had evaporated the Rain Water ; the matter of fact to me seems hardly credible : But if it be so, I think it can hardly proceed from any other Cause than the Rains dissolving a Salt contain'd in the Earth, which, upon the Rains being evaporated, remains in the Bottom ; which is the more probable, because that within five Leagues of the Fort is the Salt Bay, which has its Name from the vast quantity of Salt digg'd near it.

The Variation of the Compass, or Magnetical Needle, in the Atlantick and Æthiopick Oceans, Anno Dom. 1706.

Variation.	Latitude.	Longit. from London.
8° 32' West.	49° 18' North.	07 29' West.
6 42	44 31	13 45
5 30	41 06	15 08
5 04	40 22	14 54
4 22	39 11	15 35
3 30	32 21	15 39
3 35	32 42	15 38
1 20	18 50	20 52
1 14	09 26	17 59
1 10	00 49	18 42
1 00	01 09	18 58
0 16	02 32	19 48
0 00	03 17	20 05

Variation.

Variation.		Latitude.		Long. from <i>London</i> .	
0° 40' East.		03° 58' South.		20° 27' West.	
1 02		05 09		21 39	
1 30		06 21		22 08	
1 50		08 03		23 15	
2 10		09 07		23 35	
3 32		12 03		25 03	
6 04		18 53		26 30	
6 19		19 51		27 02	
6 20		21 26		28 14	
6 30		21 48		28 10	
7 00		21 58		28 23	
6 45		24 45		27 56	
6 36		27 11		27 17	
5 04		33 53		16 58	
0 00		34 21		01 29	30"
1 00 West.		34 15		01 33	East.
4 16		33 41		06 23	
8 46		34 39		13 02	
11 56		34 30		16 15	<i>at the Cape</i>
11 30		32 51		13 41	<i>of Good</i>
10 00		30 21		11 46	<i>Hope.</i>
09 44		29 51		11 44	
09 34		29 28		11 31	
09 22		28 56		11 05	
09 04		27 38		10 01	
08 30		26 55		08 45	
08 02		25 41		07 22	
07 32		24 32		05 43	
01 52		16 00		06 30	West <i>at the</i>
					<i>Isle of St. Helena.</i>

VIII. *Epistola, in qua ratio redditur Libri nuper editi, cui titulus, De Arthritide Anomala, sive Interna, Dissertatio. Auctore Guil. Musgrave, M. D. Coll. Med. Lond. & Reg. Societ. Socio.*

Viro Clarissimo, *Hans Sloane, Med. Doct. Regiæ Societatis a Secretis, S. P. D. Guilh. Musgrave.*

DE *Arthritidis* in *Primigeniam* & *Symptomaticam* divisione, ad explicandum & tollendum multiformem hunc Affectum utilissimâ ; deque altero divisorum Membro, nimirum [*Arthritide Symptomatica* ;] in Dissertatione, annis abhinc aliquot, in lucem edita, differuimus : Aliam, (Vir Clarissime!) nunc propono, non minus utilem, atque adeo necessariam *Arthritidis* Divisionem, in *Regularem* & *Anomalam*.

Quum *Arthritis* Actio sit Naturæ, in sui defensionem alienum aliquod è Sanguine proturbantis ; ea præcipue *Regularis* est habenda, quâ, ex Naturæ proposito, alienum id, in locum idoneum, modo maxime convenienti, ejiciatur. Hoc autem apte ; hoc ægri summò cum emolumento, longæque amplissimo, fit in *Artubus* ; quos suapte sponte adit *Arthritis* ; quos sæpissime frequentat ; & in quibus, hæc de Causa, sedem ponere judicetur *Regularis*.

Quoties autem *Truncum*, aut aliquam ejus Partem Organicam, invadit ea ; quando isthoc ex Naturæ sive imbecillitate, seu frustratione fiat, & in Ægri mortem, aut periculum sæpe definat ; hæc *Arthritis* appellari potest *Anomala*.

Posita

Posita hac Divisione, quæ tam *Symptomaticæ*, quam *Primigeniæ* est *Arthritidos*, (utraque enim extra normam, & in alieno loco interdum agit) in Dissertatione mox edenda aggredior *Anomalam*; Corporis *Truncum* affligentem, ex-cruciantem: Eoque lubentius aggredior, quoniam, primum, hujusce generis *Arthritides* sunt permultæ, & valde inter se dissimiles: Deinde, magnam partem obscuræ, detectuque difficiles, & identidem periculosæ: Et postremo quia, tamen Veteribus (*Demetrio* scil. *Paulo Æginetæ*, *Galeno*, & *Aretæo*) non incognitæ; à plerisque tamen prætermittæ; à nemine unquam Medicorum, quod sciam, ex industria tractatæ; nedum a quoquam, uti par est, & pro rei dignitate, fuerunt expositæ.

Qua quidem Medicorum, hac in re, incuria factum est; ut, ex iis ægrotantibus, qui *Dolore Colico*; qui *Dysenteria*; qui *Asthmate*; qui *Phibisi*; qui *Angina*; qui *Apoplexia*; qui *Paralyse*; aliisque non paucis Affectibus exquisitis, veris, & genuinis perimi censerentur; revera *Arthritide*, sive ejus *Materia*; modo *Ventriculum*; modo *Intestina*; modo *Pulmonem*; modo *Fauces*; modo *Cerebrum*; aliasque *Trunci* *Regiones* occupante, premente, & graviter urgente, perimerentur; non tantum *Morte*, verum etiam *Morbi Causa*, propriaque *Medendi* *methodo* incompetâ, & penitus ignota, infelices.

In tradendis hisce *Anomaliis*, earum *Diagnoses* ex *Symptomatum Ordinibus*, sive earum *Historiis*, sunt elicendæ. *Ordines* hi *Symptomatum Pathognomonici* in eo concordant, quod ab *Arthritide Regulari* sumant ad unum omnes initium: Quandoquidem, de *Anomale Arthritidos* *ἡ ἀνωμαλία*, minime constare poterit, nisi de *Arthritide Regulari* præcurrente, prius constiterit: Atque hæc istarum *Ἀνωμαλῶν* est *Par*s prima.

Discordant eo, quod eodem loco incipientes diversas omnes capeffant *Vias*: Uti *Radij* ejusdem *Circuli* ab eodem *Puncto* (nempe *Centro*) incipiunt; at, in diversa
abeuntes,

abeuntes, variis in Peripheria Punctis terminantur. E. g. *Colica*, *Phthisis*, & *Apoplexia*, quotiescunque Morbi sunt *Arthritici*, consentiunt in eo, quod *Arthritidi regulari* succrescant, & ex ejus Miasmate fiant, & committantur omnes : At quum Miasma illud nunc ad *Interanea* sit appulsum, ubi *Colicam* facit ; nunc ad *Pulmonem*, ubi *Phthisin* ; nunc ad *Cerebrum*, ubi *Apoplexiam* ; iccirco hujus *Colicæ*, *Phthiseos*, *Apoplexiæ* (id est, harum *Arthritidum Anomalarum*) Diagnoses partim ex *Intestinorum*, *Pulmonis*, *Cerebri*, nimirum ex locorum affectorum accidentibus sunt duccendæ : Atque hæc locorum internorum ab *Arthritide* in iis infixa affectorum, accidentia, *Διαγνώσκων* harum est quod reliquum.

Canon harum *Anomaliarum* Pathognomonicus, hic est generalis ; *Quo certior Arthritidos regularis* *ῥαγξίς*, & *illius Materiæ*, in ea, quæ intus sunt, quo postea certior est *Translatio* ; eo confidentius *Anomalam*, & quidem in parte *nuperrime occupata*, esse *Arthritidem*, possimus statuere.

Ut autem *Arthritis Regularis* in *Provincia Exteriori*, sive *Artubus* ; ita, in *Provincia Interiori*, sive *Trunco*, *Anomala* alios aliis locos frequentius subintrat ; gravius adfligit ; & profecto tam multos, ut in omni *Trunco*, quæ ea prorsus sit immunis, atque ex toto liber, vix reperiatur. *Ἄριστον, εἰς ὅσον ἔσται τὸ κακόν.*

Causæ harum *Anomalarum* sunt, primum, Miasma *Arthriticum*, diu in Sanguine contentum ; jam autem exulans, & Parti in *Trunco* alicui *Organicæ* commissum : Deinde, Partis affectæ imbecillitas, sive nativa, sive casu facta ; qua, ad onus suscipiendum, præ ceteris aptum, & proclive reddatur. Atque hæc duæ Causæ sunt *Internæ*, & in *Anomaliis* hisce universis locum obtinent : Alia est *Externa*, & evidens Causa ; omne scil. quod Miasma, vel à τοῖς ἔξωθεν repellens, vel iis affigi prohibens, ad ea, quæ intus sunt, illud intrudat.

Differunt hæc *Anomalie* inter se, *ratione Loci*, five *subiecti*: Est enim alia *Ventriculi* ; alia *Pulmonum* ; alia *Cerebri*, &c. Tum *ratione Causarum*, quæ nunc remissius, nunc autem fortius agunt ; &, diversis agendi modis, diversas (*ratione Magnitudinis*) faciant *Anomalias* : Tum postremo *ratione Materiæ*, quæ pura puta nunc *Arthritica* ; nunc autem *Scrofulosa* ; nunc *Scorbutica* ; vel istiusmodi aliena est.

Medendi Indicatio generalis in eo consistit, ut *Arthritide Anomala* Pars affecta, quam citissime, quam tutissime levetur. Hæc autem fit, *Materiam* in ea depositam partim è Corpore evocando ; partim in Artus, in locum minus nobilem & sedem suam, transferendo.

Evocatur è Corpore *Materia* interdum *Venesectione* ; sæpe *Purgatione* ; nonnunquam *Diaphoresi* ; alias *Epispasticis* ; modo *Anacatharsi* ; interdum *Errhinis*, &c.

Premissis, quæ oportet, Evacuationibus, Curatio reliqua (quæ quidem hujus Dissertationis opus est præcipuum) optime perficitur, per *Materiæ* in Artus Translationem : Hæc enim ipsa Naturæ via est.

Ἄ δὲ ἀγνῶν, οὗ αὖν μέγιστα πῖπν, ἢ οὐσίς, τὰς αὖ ἀγνῶν, διὰ τῶν ἐνυπνῶν χερσίων. Quæ ducenda sunt, eo ducenda, quo maxime Natura viam affectat, per loca lege Naturæ commoda.

Et quidem huic *Arthritidis* Expulsioni eo potius suo tempore incumbendum ; quoniam *Materia*, quæ, post Evacuationes, in sanguine soleat *Arthritica* restare ; quæque ceteroqui partem nuper affectam repetat ; nullo quidem modo utilius, feliciusve, quam per Articula, possit extrudi.

Auxilia *Arthritidi*, ἢ τῶν ἐνδὲν *Anomaliæ*, ad τὰ Ἀρθρὰ removendæ, & in viam reducendæ apta, sunt tum *Interna*, tum *Externa*.

Interna, *Arthritidem* expellentia, five ποδαρρηγγοῦντα, sunt è Classe Medicamentorum *Cardiaca* magna ex parte selecta ; ut *Pulvis è Chelis C. C.* *Theriaca Andromachi*, *Spiritus volatiles*,

tiles, Vinum, cum multis istiusmodi aliis : Quibus addi oportebit è *Ferro Præparata*, tanquam hac in re valentissima : Maxime vero placet *Alcohol Martis*, five *Rubigo* ejus subtilissima ; quæ, ut reliqua omnia Præparata viribus æquare, ita quidem mollitie superare, unde Corporibus renellulis convenire reperitur.

En ejus *Exemplar*.

R. *Limaturæ Ferri* lb. x. *Sartagine*, vel *Patella terrea*, vitro obducta, *Urina madefac humana* ; æstivo sole, vel ad *Ignem sicca* ; iterumque (*Spatula Ferri* particulas, ne coalescant, bis in die agitando) irrora ; donec abeat in *Rubiginem Massâ*. Excelsam, & *Rubigine confectam* eam, in Mortario ferreo contunde : Tensam, & in pulverem redactam, situla, quatuor circiter Congios *Aquæ fontanæ* continenti, injice. Pulverem cum *Aquâ* commisce. Horæ post quadrantem, *Aquæ*, quod summum est, & minus turbidum, leniter detrahe ; & ad pulveris, in ea natantis, siccitatem evapora. Quod in situla relictum est humoris, similiter evaporetur. Pulvis in fundo crassior *Urina* irroretur, &c. uti prius : Itaque *Nutritio*, *Tritura*, perq; *Aquam* separatio repetatur, donec omne *Ferrum* in Pollinem matabitur. *Chartæ Emporeticæ*, Coni in formam circumvolutæ, *Pulveres* siccator inde ; *Aquam fontanam* fervescens, paulatim, & per vices, superaffunde ; donec urinoso sale penitus abluto, exstillabit *Aqua insipida*. Pulverem denno exsicca, & usui serva.

Ferrum hoc *Nutritum* est, five *Rubigo* ejus subtilissima, merum *Alcohol* ; non solum *Arthritide*, verum etiam *Chronicis* plerisque aliis, ægrotantibus, præcipue teneris & imbecillibus utilissimum. Dosis \mathfrak{ss} , semel, bis in die, pro re nata, cum veliculo idoneo.

Præter hæc communia, alia sunt *Interna*, quæ *Anomaliis* quibusdam singularibus occurrunt, & locis suis traduntur.

Si, ex *Internorum* usu, dies quatuor vel quinque continuato, nihil in Artubus Doloris, nulla *Arthritis* excitabitur; Articulo dolere solito, & sæpissime afflicto, vel quam proxime eum, applicetur *Emplastrum*, aut *Ceratum*, aut *Phænignus*; aliudve aliquod Materiam potenter eximens, & Tumorem elevans; cui denique Tumori, Methodo prædicta facto, *Epispasticum*, idque (si videbitur quod appellant *Perpetuum*, dies complusculos duraturum, admoveatur.

Hæc *Anomala*, sive *Internæ Arthritidos* Medicina generalis: Ut autem clarius intellegatur, è multis unam, & alteram *Anomalam*, specialius exponam.

Materia *Arthritica* minime sic, ut par est, è sanguine in Artus emissa; aut ex iis, causa aliqua evidenti & externa, retro acta, nunc *Ventriculum* (sive, ejus imbecillitate, sive reliquiis τῶν συνόψεων, in eo congestis allecta) intrat. Hinc *Αντιέμεσις*, *Nausæa*, *Vomitio*; hinc *Virium* paulatim *imminutio*, *Macies*, & demum post menses aliquot (serius citiusve, pro ægroti robore) Mors. Ut malo tam gravi, nec quidem raro occurratur, è re futurum arbitror (præmissa Catharsi, altera, vel utraque) *ποδαπαγωγῆς internis*, hospitio novo, & cuique usurpato, Hostem exturbare, & in Artus pellere: Quam quidem operam, in hac *Anomala*, egregie præstant *Stomachica*, *Cardiaca*, & *Alexeteria* generosissima, frequenti & magna dosi adhibita: Quibus (si bidui, vel tridui spatio minime doleant Articuli) in subsidium veniant *Externa* modo dicta, *Articulis* creberrime dolentibus applicanda: Qua ego Methodo languidos, & marcescentes *Arthriticos*, certe non paucos, summo vitæ discrimine liberatos, sibi restitutos novi.

Simili modo *Pulmonem* aliquando virus infarcit, & corrodit *Arthriticum*; unde *Tussis*, *Sputatio*, *Facies* pallor, *Æstus Corporis Universalis*, *Phthiſeos* scil. incipit signa: Quam tamen, ne ingravescat, ut prævertas, non id tam *Cortice*, Lacte & ejusmodi *Frigidis* (sic, ut in *Phthiſi Primigenia*)

Primigenia) præstari possi ; quam *Calidioribus* ; *Balsamis* scil. & *Sulfure* præparatis ; quæ *Arthritida* partim, *Alia* catharsi expellant, partim ad 1^{am} *Apæ* fugent, exploratum est.

Quinetiam in *Apoplexia*, quæ dicatur, *Arthritica*, morbo utique tam crebro, quam ancipiti, nihil *Cerebro* prope modum oppresso, secundum *Evacuationes*, magis opitulatur ; quam è *Capite* Hostem *Phoenigmis*, & ejusmodi educantibus, quasi *μοχλικοῖς* in *Artus* evellere.

Prophylaxeos ergo, tum in prædictis, tum aliis quibuscunque hujus generis *Anomaliis*, magni utique momenti est, *Materia Arthritica* ne in *Sanguine* renovetur ; renovata vero ne ἀναμύλων agat, diligenter curam adhibere.

Capitum ordo, & Inscriptiones sunt hujusmodi.

Caput I. **D**E *Arthritide Anomala*, generatim.

Caput II. **D**E *Affectibus Ventriculi Arthritici*.

Caput III. *De Colica Arthrica*.

Caput IV. *De Diarrhœa Arthritica*.

Caput V. *De Dysenteria Arthritica*.

Caput VI. *De Abscessu Intestinorum Arthritico*.

Caput VII. *De Melancholia Arthritica*.

Caput VIII. *De Syncope Arthritica*.

Caput IX. *De Calculo Renum Arthritico*.

Caput X. *De Asthmate Arthritico*.

Caput XI. *De Catarrho, Tussi, & Peripneumonia Arthriticis*.

Caput XII. *De Phthisi Arthritica*.

Caput XIII. *De Angina Arthritica*.

Caput XIV. *De Capitis Dolore, & Vertigine Arthritica*.

Caput XV. *De Apoplexia Arthritica*.

Caput XVI. *De Paralyse Arthritica*.

Caput

Caput XVII. *De Doloribus in Corpore vagis, fixis; de Ophthalmia; de Erysipelate; & Achori-
bus Arthriticis.*

Caput XVIII. *De Epiphora, & Dolore Dentium Ar-
thritico.*

Caput XIX. *Corollaria continet, cum Epilogo.*

Hæc sunt (Vir Clarissime!) Quæ de *Interna Arthritide*, Affectu non novo, sed cum magno humani generis incommodo à nostris Hominibus neglecto, lucubravi; & quidem, quantum in me est, ad *Hippocratis* mentem: Ita enim Ille,

Καὶ τὸτο ἐν εἰδέναι χρεῖ, ἔτε Διόλου ἢ Νέστο, ἔτε Μελαπίπτε ἐν
ἐρίῃ Νέστον.

Vale, *Vir Doctissime!* Et *Societatem* summam, qua decet, *Observantia* meo *Nomine* saluta.

Iscæ Damnoniorum, 3 Idus Aprilis, MDCCVII.

IX. *An Account of a Book, intituled, The Whole Art of Husbandry. By J. M. Esq; F. R. S.*

THIS Book gives an Account of the several Ways and Methods about the Inclosing of Land.

The way of ordering and improving of all sorts of Pasture and Meadow Land, and of the overflowing and draining Marsh and Boggy Lands, &c.

The way of making of Hay, and the Management of Clover, St. Foin, and other *French* Grasses.

The ordering of all sorts of Arable Lands for all sorts of Grains; the making of several sorts of Ploughs, and the
different

different ways used in several Counties, for the improvement of Chalkey, Sandy, Gravelly, Stony, Clay, and other sorts of Land.

An Account of the several sorts of Manure used for the improvement of Land ; as of Burning of Land, of several sorts of Marle, of Sea Sand, Dung, Ashes, &c. and what is properest and best for each sort of Soil, &c.

Of the ordering of the several sorts of Corn and Grain, as Wheat, Rye, &c. and what Soil is best for each particular sort, &c.

Of the several ways of preserving of Corn, the making of Graineries, and the ordering of each sort for Keeping, &c.

Of the several Methods used for the ordering of Beasts, Fowls, Insects, and other things necessary for the Stocking of a Farm.

Of such things as are Injurious to the Husbandman, with Remedies for the same.

Of the general use of all sorts of Grain ; of several ways of making Malt, &c.

Of the several Instruments, Tools and Engines necessary for the Husbandman : Of Building and Repairs, and of the several sorts of Work belonging to the Husbandman, with the Cost and Charges of each.

Of the Benefit and Advantage of Timber Trees, and what Soils are best for each sort, and the way of Raising, Planting, and ordering of all sort of Timber Trees, and Coppice Wood, &c.

Of the Raising of Fruit Trees, the making of a Nursery, the several ways of Grafting, Inoculating, &c. the way of Cultivating the Ground, with Directions how to prune and manage each particular sort of Fruit, and a Catalogue of several sorts of Fruit, with particular Remarks on them.

Of the ordering of Vines, the making of Vineyards, and of *English* Wine.

Of several ways of making *English* Liquors ; as Beer, Ale, Cyder, Mum, and several sorts of *English* Wines, &c. with many other Particulars, too long to be inserted here.

The whole Work contains a compleat Collection of what the Ancients and Moderns have writ about this Subject, and near a third part of it is new Experiments and Improvements ; giving an account of all the Ways and Methods used in several Counties, especially about *London* ; with a design to procure intelligence concerning the several sorts of Husbandry used in all Parts of *England*, in order to make a compleat System of it : Which the Author hopes all that are willing to promote so useful a Work will assist him in ; and he thinks what he has already done, will make it easie for any so to do, because he has therein stated the Practice of the above mentioned Places ; so that every one may readily know what different Methods, and what particular sort of Management, is used upon any sorts of Lands by either themselves or their Neighbours in the places where they live, which is not mentioned in the afore said Book, and by that means be easily able to give an account to the Publisher.

Philosophical Transactions.

For the Months of July, August, and September, 1707.

The CONTENTS.

- I. *De Conchyliis Turbinatis, Bivalvibus & Univalvibus, item de Mineralibus, Fossilibus, & Thermis Phillippenfis, ex MSS. R. P. Geo. Jos. Kamel. Communicavit D. Jacobus Petiver, Pharmacop. Londin. & Soc. Reg. S.*
- II. *An Account of an Experiment, touching the quantity of Air produced from a certain quantity of Gunpowder fired in common Air; by Mr F. Hauksbee, F. R. S.*
- III. *An Experiment shewing, that the Spring or Constituent Parts of Air are capable to suffer such disorder, by a violent impulse, as to require time to recover their Natural State; by Mr Fr. Hauksbee, F. R. S.*
- IV. *Part of a Letter from Dr Archibald Adams of Norwich, to Dr Edward Tyfon, Fellow of the College of Physicians and Royal Society; concerning a monstrous Calf, and some things observable in the Anatomy of a humane Ear.*
- V. *An Extract of a Letter to his Excellency Signior Francisco Cornaro, Ambassador from the Republick of Venice to the Queen of Great Britain, &c. By Anthony Van Leeuwenhoek, F. R. S. Containing Microscopical Observations on the Salts of Pearls, Oyster-shells, &c.*
- VI. *Part of a Letter written to Signior Antonio Magliabechi, by Mr Anthony Van Leeuwenhoek, F. R. S. concerning the Particles of Silver dissolv'd in Aqua Fortis, &c.*
- VII. *An Account of a Book, entitled, A Voyage to the Islands of Madera Barbadoes, Nieves, St Christophers, and Jamaica; with the Natural History of the Herbs and Trees, four-footed Beasts, Fishes, Birds, Insects, Reptiles, &c. of the last of those Islands. To which is prefixed an Introduction, wherein is an Account of the Inhabitants, Air, Waters, Diseases, Trade, &c. of that Place, and some Relations concerning the Neighbouring Continent and Islands of America. Illustrated with the Figures of the Things described, which have not been heretofore engraved, in large Copper Plates as big as the Life, By Hans Sloane, M. D. Fellow of the College of Physicians, and Secretary of the Royal Society. In two Volumes, in fol.*
- VIII. *A Letter from Mr William Baxter, to Dr Hans Sloane, R. S. Sec. containing an Account of a Book intitled Archæologia Britannica, giving some Account additional to what has been hitherto published of the Languages, Histories and Customs of the Original Inhabitants of Great Britain; from Collections and Observations in Travels through Wales, Bas Bretagne, Ireland and Scotland. By Edward Lhuyd, M. A. of Jesus College, Keeper of the Ashmolean Museum in Oxford. Vol. I. Oxford Printed at the Theater for the Author, 1707. And delivered at the Ashmolean Museum.*

1. De Conchy lijs *Turbinatis*, *Bivalvibus* & *Univalvibus*, item de *Mineralibus*, *Fossilibus*, & *Thermis Phillipensibus*, ex MSS. R. P. Geo. Jos. Kamel. Communicavit D. Jacobus Petiver, Pharmacop. Londin. & Soc. Reg. S.

L A G A N G doimit. Biyco: Binga vel Tinge Indorum. Est *Nautilus* Tubulatus ingens, fascijs rubris circumjectis distinctus, ipsa puppe nigra.

2. Budiong. *Buccinum* est cubitale quo Indus ad indicandum periculum Inimici, Ignis aut Mortis Amici utitur.

3. Saang. *Murex* maximus, deforis scaber, exalbido & fusco commaculatus, internè quam elegantissimè politus, ex albo rubescens, in sex aduncos canaliculatos, palmares & longiores mucrones, per circumferentiam explicatus.

4. Balic-gogoco. *Purpura* est stria subrubra & duplici internè & deforis cincta.

5. Ganga. *Murex* alter, totus exalbidus, in septem unciales & sesquiunciales mucrones, canaliculatos pariter, sed uno latere tantum exeuntes diductus: *Coracoidi* similis.

6. Lagang vel Lanhang Bys: Lumbanlinga C. Viarmata bulang M. Est *Cochlea* maxima, muricata, ponderosa, pendens uncias triginta, sine animali & sine cooperulo, apice brevi, ore ventricosè expanso; Exalbida deforis & Gypsea, polita verò argentea, ut est internè: Ex hac communiter Aceto emollita cochlearia efformantur.

Hujus

Hujus *Cochleæ operculum* Indj Bys. *Luguc M. Matanglahang* vocant; Scriptores *Fabam marinam*, *Umbilicum marinum*, *Umbilicum Veneris*, *Oculum marinum*: Hujate partē quā latissimum palmare est pendens ad uncias sex: *Marianum* communiter tantum unciale, unde & alia *verrucosa* ^{Vires.} mittuntur. *Fabam marinam* *Schroderus* oculis prodesse & *Erysipelata* tollere gestatam scribit. Umbilico applicatam laudant ad Colicam.

Baccius Sanguinem undequaq; profluentem mirificè sistere tradit, parte averſa cum saliva fronti applicitam; in polline nimium mensium fluxum cohibere & ijs qui sanguinem per os rejiciunt utiliter exhiberi. M. S. Miraculosè et efficaciter Oculorum cataractas, nubeculis carnositates et suffusiones defluxionesve sanare, si cum lacte Mulieris in vase cupreo atteratur, donec lac glaucescat, & guttæ aliquot mane & ad vesperam oculis instillantur: In humoris magno affluxu *Faba* cum succo *Limonis* in vase ferreo circumagitur: Si vero Oculi tantum obfuscati videantur *Faba* cum lacte Muliebri in vase argenteo confricatur.

7. *Calin huga* Tag. & P. *an Alucaba vel Anicunub Bys?* Est *Conchylum* parvum & Turbinatum, cujus odoriferum cooperculum ustum *Indæ* oleo decoquant. *An Conchylum*, *Concha longa*, *Blatta Byzantia*, seu unguis odoratus?

8. *Banifilis*. Turbo seu Buccinum *Fabij Columnæ*. Bipalmam longum.

9. *Bagongbon vel Balibit*. Turbo lævis non striatus marmoreus, subluteus, candidis & rotundis maculis ornatus, ferè sesquipalmaris.

10. *Alium* asservo palmo longiorem, apice mediocriter producto seu corpore *Banifil* magis toroso, orbibus depressis & in albo subluteis, subfuscis & his ferè quadrangularibus maculis variegatum.

11. *Palid* Indorum, *Cochlea* est *Cylindroides*, figuræ Cylindroidis alteræ *Ionstonij*, coloris sublutei, albis & ferè triangularibus undatim picturata maculis.

12. *Trochus*

A. Nepht. Natur. & Art. Tab. 47. Fig. xi.

12. Trochus *Luzon*. albis maculis, nigro reticulo textus Gazophylacij Naturæ & Artis Tab. 47. Fig. xi. *Dalimanoc* Indis. *Cochlea Pyramidalis* seu *Trochus inversus* ore est lato in pyramidem assurgente apice muricato in subplanam sedem coacto, palmaris, marmorea, maculis albis majoribus in nigro reticulatam constituentibus.

13. *Cochlea cælata*. Indis *Binga* Gazophyl. Natur. & Art. Tab. 48. Fig. xiii. *Conche Persicæ similis*, centro parum sinuato, apice brevi, ore ventricosè expansio ubi et fulcis transversis ad modum prominentibus cælata, lævis cæterum, cinereò, luteo & fusco variegata.

14. *Cochlea* leviter muricata, ore latè in ventrem producto, exalbida subluteis maculis undatim triangularitervè variegata.

15. *Tamongcay*. *Cochlea* marina vesca, parva, subrotunda, albissima, & arena sarcta qua ut volunt alitur.

16. *Sofo vel Sufu*. *Cochlea* est parva, lutescens, vesca, subrotunda, fluviatilis. Cooperculo gypseo, lævi & flavescente donata.

13. *Omaneg*. *Cochlea* ferme pugno suppar, noctu domus subrepens, & *Cochlêa* multum strepitûs causans; non est vesca.

14. *Biyoco*. *Cochlea* parva, parietes & arbores scandens, fluviatilis.

15. *Buhay*. *Cochlea* fluviatilis & campestris sat magna, inhærens arboribus & strepitum edens.

16. *Cochleas* terrestres vescal, quibus *Vinæ* abundant, amplexu conglutinari & oviperas esse observavj sæpius in *Bohemia* Anno 1684, cum scrobiculo superimpositæ ova alba, orbicularia, parvò pisô paria excluderent. Ut rectè scribit *Antonius Felix* Abbas *Marsiliensis* apud *Malphigtum*.

17. *Tangali* Indorum, *alijs* *Samong*. *Trochus* est de foris albida & rubente cretaceave tunica obductus, politus, argenteus totus ut *Mater Perlarum* Offic. orbibus subplanis, ad apicem subverrucosis.

18. *Lisbit*

18. Lisbit. *Trochus* est parvulus ponderosus quo *Indi* utuntur eum retium marginibus appendendo.

19. Saliray *Indorum*. Sunt *Pectines* German: *Concha Sancti Jacobi* vel *Peregrinorum*, modo tenuissime carinis striatim imbricati jam minus varieq; deorsum striati virgatique. Interne argentej, margine Corallino limitati.

20. Talaba. *Ostreum* est ordinarium sepius *Margaritifera*.

21. *Conchæ Tiquassay* facies externa *Kamel*, *Gazoph. Nat.* *Gaz. Natur.* & *Art. Tab. 45. Fig. iii.* *Ostreum* est oblongum nigrum tenue bivalve fragile, faxis & *Matriporis* inherens. *Art. Tab. 45. Fig. iii.*

22. Calantipay. *Ostreum* tenue & delicatum.

23. *Taclobo* *Indorum*. *Ostreum* est maximum bivalve, striatim carinis palmaribus aut latioribus imbricatim rugosum & asperum. Hujus speciei esse videtur *Imbricatum Tridacnes* *Aldrovandinum*, & illud de quo *Johnstonius*. *Maris Borneoci* quod carnis habebat 47 *lib.* Monstruosum est quandoq; & ponderosissimum ita ut sæpe *Indos* captos perire faciat, alij vero brachio vel pede mutilati eradant. Non semel carne unius 30 & 40 *Indorum* saturati fuere. Horum unum cum aliorum *Conchyliorum* multitudine visitur in altissimo monte *Amandivi*, quod hominem jacentem & quatuor capit aquæ urnas. *Perlæ* si non potius *Lapides* dicendi in his inveniuntur formæ teretis, magnitudinis digiti, non nihilum pellucidi.

24. De *Conchis* & *Conchylijs* quæ numerosa & prægrandia in summis montium jugis reperiuntur varij varia: An non & ab aereo vertice a proximo mari sublata, illi rupto vortice dimissa spargi possunt?

25. *Buca*. Species est *Taclobo* minoris.

26. *Lattiau* *Indis*. *Concha Margaritifera major* perelegans & selectissima. Pedem Geometricum longa, tota nitide argentea, ferens uniones pulchros, magnos selectimos deferitur ex *Playa Honda*. Et hanc si matrem *Perlarum* *Margaritis* substituere licet, ut censet *Serapio*, *Rondeletius* & *Velesius* substituerem, a similis siquidem principio

cipio similes sequuntur effectus. Harum quoq; (acri lixivio decolores membranas separando & alterum ex materia Cretaceâ abradendo) purgatarum pulverem in usu Medico ipsarum Margaritarum locum optimi supplere posse censet *M. Lister* in append. ad Hist. Animal. Angl. *Goedartio* annexo. addens sane quantum scio, accomodatissimus est, ad Medicamenta quævis, in quibus requiruntur vel ipsa Margarita vel Oculj Cancrorum dicti vel ipsum Corallium. Margaritam *Ovi Gallinacej* magnitudinis videre erat in *Jolo* circa *Tabitabi* quam præter Indos plures, vidisse affirmavit *Petrus Durian de Montforte* Hispanus, Vir fide dignus.

27. *Corculum ex Lattiau* effectum habuit proliferum.

28. *Unionem* proliferum proffidet.

29. *Massabay*. *Concha* est *Margaritifera ordinaria*, seu *Officinarum Mater Perlarum*, *Spithamea*, argenteo-cærulefscens, perlas habet pulchras, numerosas, parvas communiter, invenitur ubertim in *Paranas*, *Giguan*, *Balangiguan*, & *Portu Acapulco*, &c.

Fig.

30. *Baliad* alijs *Bunchul*. *Concha* est *bivalvis*, ferme *spithamea* ex subplano-recurva, ad marginem interne polita, fusco purpurea vel maculis ejusdem coloris sparsim variegata, deforis exalbida quasi squamose & undatim imbricata. *Perlas* gignit, sed exiguas, & inæquales, abundat in *Giguan*.

Fig.

31. *Lampyron vel Tipay, vel Cappis*. *Concha* est *bivalvis* plana, tenuis rotunda, ferme *spithamea*, lævis, candida & pellucida, materie constans prope eadem ac *Baliad*, seu fissili ut *Alumen plumosum*. *Perlas* aliquando generat sed pallentes & minutissimas. In *Luzone* vitri loco deservit pro fenestris. Pulverem aceto forti & calido subactum laudant ad tumorem testium & Herniam aquosam.

Usus &
Vires.

Fig.

32. *Dilab*. *Indorum*. *Mytulus* est *niger maximus*, seu *Concha nigra* pedalis aut cubitalis longitudinis, interne splendens et perpolita, deforis modicum scabra & paucis quibus-

quibusdam quasi imbricatim unguibus aspera, cæterum matris Perlarum tenuior; Animal *Indis* in cibum venit, *Vires.* sed si non optime coctum fuerit, inebriat. *Uniones* gerit atras ut *Succinum nigrum*.

33. Concha *Luzonis* tubularis virefcens, *Gazoph. Nat. & Art. Tab. 32. Fig. ix.* Concha caudata *Kamelj.* Boca *Gaz. Natur. & Art. Tab. 32. Fig. ix.* de Pato *Hispan* i. e. rostrum *Anatis.* Balay *Indis* Tag. *Udpan Bys.* Conchula est arctissime clausa, unciam lata, biunciam longior in modum rostri *Anatis* aperibilis, ad nexum palmo longiorem, candidum, duriusculam, carneam, & fistularem habens caudam cujus extremo ut *Hirundo* saxis hæret; Animalculum formæ ferreæ est pre-*Vires.* sentis crudum, esitatum Febrim inducit, corpus inflat & pruritum causat, editur probe coctum.

34. Concha caudata altera. Candida est, similis Conchæ longæ, sed brevior obrotunda, solidior & latere hians, *Fig.* cæterum priori similis.

35. Calangcalangan vel Bacacay *Bys.* Conchæ Chamæ, tineis multis, obliquis & cavis & piloso musco obductæ. an nigra *Bellonij*? Pro Calce paranda pro Betele.

36. Alayan. *Tellinæ* species, venditur una cum *Bacacay.*

37. Cabebe. *Mytilus* fluviatilis.

38. Tahong. *Musculj,* Concha longa tenuis, deforis fusca, splendens interne violacea & lævis ut externe.

39. Cabilj. *Musculus.*

40. Luna. *Musculus.*

41. Halaan. *Musculus.*

42. Paros. *Musculus.*

43. Locan. *Musculus.*

44. Bulaburgat Indorum. Concha est *Corallina,* deforis Pectinatim, imbricatimve aspera, interne colore Corallino fundus inumbratur.

45. Altera lævis striata, tantum pectinatim, deforis exalbida interne striatim argentea.

G. Natur.
& Art. Tab.
10. Fig. xii.

46. Sifi. *Balani* sunt *Gygantis* magnitudinis *Pomi Misi-*
niacj striati figuræ nidi avium, aſſervo binos Coralloide
cærulea *Baganghang* concluſo. *Gazoph. Nat. & Art. Tab.*
10. Fig. xii.

Fig.

47. *Baliſungay*. Eſt *Patella* parte latiffimâ, palmaris,
deſoris ſcabra exalbida gypſea; interne leviffima & ſplen-
dens, cujus fundum ſubſuſca quaſi *Pomum Imperialis* ſeu
Ananas figura inumbrat, à qua novem lati & magis di-
lute fulci radij & totidem albicantes ſeſe diffundunt in
marginem uſque.

48. *Talacon*. Eſt *Patella* in vertice ſquammoſa, ad mar-
ginem ſetis quaſi Porcinis ſtipata.

49. *Lapas Indorum* eſt *Huias Carina Nautilus*, 1 *John-*
ſton. Patella fera ſeu *Auris marina*. Oblonga tenuis ni-
tide argentea, palmam longa, ſeſquiunciam lata.

50. *Altera* craſſa eſt ſubrotunda deſoris fuſce rubens
interne argentea, forma & magnitudinis qua eleganter
in *Ephem. Medic.* Decade annorum Secunda Anni quarti
depingitur.

51. *Buſci, Bulago*, vel *Bulabo Indorum*. Eſt *Concha*
Veneræ pugno major, in albido, piſo paribus & fuſcis ma-
culis varia, cæterum lævis & ſubrotunda utrumq; ubi in
ſe recolligitur denticulata.

52. *Altera*, ubi in ſe recolligitur pariter utrimque den-
ticulata, ibidem ſubplana & fuſca; in gibbo verò a pri-
mum ſubfuſcis & totidem albis faſcijs picta dein in iſdem
varijs maculis interſtincta.

53. *Tertia*, Ubi in ſe recolligitur uno tantum latere &
leviter denticulata, altero ovalis interne fuſce rubens, ex-
terne tota candida. *an Malimacan Indorum?*

54. *Sigay*. *Concha* eſt *Veneræ* parva, *Moneta Siamen-*
ſum.

55. *Pinapagi*. Species *Sigay*, ſed candida.

De Mineralibus Fossilibus & Thermis Philippenfis.

1. *Carniolum pellucidum*, coloris aquæ purissimæ, Camphoræ, Lactis, Perlarum, Succini lutescentis & loturæ carniū, uti est plurium enumeratorum colorum in uno, collegi Anno 1688 In littore Umatag, insulæ Marianarum Quajhan. Deferuntur ut puto torrentium cursa ex Mediterraneis in littus, ubi cum *Faba Marina minori* collegi.

2. *Diamantes*, in *Ochon* effodiuntur, minus pretiosi.

3. *Sangaralj*. Gemma rubens mediæ estimationis.

4. *Cabigin*. *Cornerina* Hispan. Est *Orychinus*, desertur Borneo & Gumaca.

5. *Batobalani vel Pauhinangay, Magnes.* in *Paracalensi* eruitur territorio.

6. *Cancer* de Haynan: *Lapideus* est cum aceto dissolutus, et inunctus inflammationes & tumores reprimat. Haustus Febribus, diarrheis, Dysenterijs, Colicæ & Cholera morbo medetur. *Dosis* ʒß ad ʒj. Vires.

7. *Cancris Petrifacti* inveniuntur et in Fluminibus *Palipicanis* una cum ligno *Molavin* & *Canna Indica vera* petrefactis. Ut in torrentibus *Paracalensibus* et *Albayanis*.

8. *Lapis Cochiformis* & *Cochlea-formis* ex fontibus *Jucatan* pro *Bezzar* habetur, uti et ille tunicatus torrentis *Tunassan*.

9. *Ceraunia Cruciformis*. In Provincia *Panay*, in territorio *Damalag*, circa montem *Pangingalon*, cum fulmine dejiuntur *Cruces Lapideæ* perfectissimæ, coloris dilute cærulescentis aliæ, aliæ obscure, magnitudinis sequiuncialis.

10. *Glossopetras Melitensibus* similimas, effossas & collectas in Provincia *Hilocos* *Manilam* attulit *D. Thomas Caruzalegui* ubi Indi eas cum fulmine dejecti referunt, & *Linguas Fulminis* vocant. Venenis hæ non resistunt. *Plinius* et alij apud *B. Cesium* eas *Lunâ* deficiente de cælo decidere

decidere tradunt. Hinc *Schroderus* post *Cerauniam* collocant.

Vires. 11. *Lapis Frigidus* de Cananor. *Lusitanis* Pedra fria. *Lapis* est *Nephritico* magis durus, facie fissilis, coloris palearis, viridescentis, & prassinj, quandoq; filamentolus, ut *Alumen plumosum*. Laudant contra Febres & Diarrheas.

Vires. 12. *Lapis Nephriticus* Chinenfis. *Sinis* Sia. Affertur in vasa majora, & animalia elaboratus, coloris terrej; lutescentis, flavi, viridescentis, subpurpurei, albicantis & rubris strijs variati & subfusi, nigricantis, & ex varijs coloribus commaculatus, commendatur ad dolores *Nephriticos*, & ardorem urinæ.

Vires. 13. *Lapis Quadratus*. *Lusitanis* Pedra du Ferro. Coloris inter *Magnetem* & *Hematitem* medij, Figura quadrangularis unde nomen, confractus non nisi in partes quadratas visitur. Inter duorum digitorum ungues in gyrum versatur. An Species *Magnetis*, vel an *Siderites Plinij*? Liquor in quo circumactus, aut attritus fuerit, Vipera- rum & aliorum venenatorum succurrit ictibus potus, & illitus Ad Partum facilitandum, foetum mortuum educendum, secundinas pellendas; menses & urinam ciendam, grumos sanguinis extravasati deturbandos propinatur idem liquor, vel inungitur Oleum, in quo attritas fuit, vel integer lapis sæmori alligatur. In Cephalalgia, Odontalgia, Ventriculj cruciatibus, Melancholia, Cholera morbo, Colicis & Iliacis doloribus, Stomachi repletionem prodesse & alvum laxare ferunt, similiter ad Diarrheas, Dysenterias & Tenesmum commendant. Liber de simplic. Medic. Galeno attributus. Habet *Lapis Quadratus* in *Aegypto* invenitur & est exalbidus. Viros habet viscidas & stringentes unde conceptum vitare dicitur, &c.

14. *Lapis Specularis Antipolanus*. Abundat in montibus *Paynam*. Candidus est, fragilis, in angularia & nientia fragmina diffiliens, non tamen in bracteas scissilis.

15. *Lignum* Molavin *Petrefactum* asservo *Paracalense* exalbidum, corticem versus subfuscum, sublustre & *Pyrste*
compa

compar soliditate. Ipsi Ligni pectinibus striatim.

16. *Alia frustra* habui coloris subglauco.

17. *Aliud* frustrum asservo *Palispicanum*, verum non videtur esse Ligni *Molavin* sed potius Ligni *Guixo*. Coloris æruginosi, corticem versus luteo & rubente & fusco varium, pectinibus minus rectis quasi interruptis.

18. Popal. Cerussa.

19. Tavas. Alumen.

20. *Terra Chinensis Lokamsig*. Alba, odorata lapidescens & aqua non diffluens est.

21. *Terra Mexicana Montis Jesus*. Fusca est bituminosa, saponis instar pinguis & lævigabilis, aqua non diffluens.

22. *Terra* argillacea alba, *Medulla Luna* accedens, *Creta* candidior nec uita nigrescens. *Savonglupa* Indis.

23. *Terre* Argillaceæ variorum colorum, ut in montibus Thermarum calidarum *Lacus Bay*.

24. *Bolus* communis. *Barha* Indis.

25. *Ochra Europeæ* similis.

26. *Gypsum* eruitur *Tunassanam* ad flumen. *Anapog* Indis.

27. *Guancabamba*, de quo *Calantza*, Lapis est albus crescens in saxo nigro *Peruvij*, ac si viveret. Valet ad Ulcera, Vulnera, Hæmorrhagias, Diarrheas, Dysenterias & Dysuriam. an Species Lactis Lunæ? Vires.

28. *Bezoar Minerale* Siculum, alijs Polvos de Funda caro. *Terra* est *Lapidea* coloris ex albido cinerej ponderosa. Operari volunt suaviter per secessum, vel per urinam, vel sudorem vel insensilem transpirationem. Propinant cum liquore conveniente horis medicis, bis aliquater per Diem, pondere ʒij pro Dosi. Dilaudent ut Panacæam universalem ad omnes morbos, specificè vero contra Febres malignas, continuas, intermittentes, tertianas & quartanas. Ad Flatuum molestiam, Diarrheas, Dysuriam, mixtum. Sanguinis, Erysipelata, Impetiginem volaticam, Pruriginem sudamina, Herpetem, Scabiem,

biem, Leporam, & alios affectus cutaneos. Imo et obstructions, sed quisq; suo abundet sensu, ego saltem nunquam insignioribus obstructions laborantibus. Hoc *Bezoar*, vel *Caspar Antonianum*, vel Nicholao Manuchianum exhibui, vel exhiberem, quia scio plures horum frequentiori usu plus damni quam utilitatis reportasse, quod non contingit ex usu *Lap. Bezoar* veri, ut pote substantia magis solubilis.

In Auriferis montibus *Buraguen* invenitur.

29. Flos Sulphuris Nativus, seu Mineralis levis, niveus, insipidas & quasi solubilis: *An Species Lactis Lunæ?* Ubi hic efforescit, subjacet Lapis durus, albus, hinc inde subnitens, ex parvis conglomeratus fragminibus, insipidus: *Floris Mater*.

30. Sulphur Nativum, vivum, seu virgineum, solare, leve, citrino aureum, splendens, & pellucidum in fragilibus glebis.

31. *Sulphur Minerale*. Sanaya & Matilang Indis. Est purum virens, ex quo liquato addito oleo fit fuscum, cujus quotannis circiter Centarij colliguntur & distrahuntur.

32. *Porog*. Indis B. *Sapo Tag. Terra Sigillata* rubra, butyracea, accedens Auxungiae solis, quâ *Aurum* tingunt.

33. *Therma Calida*, in Provincia *Albay*, ad montem excelsum ignivomum. Ibidem flumen, quod 24 horarum spatio, *Plantas, Ligna, Pisces* in *Lapides* convertit.

34. *Therma Calida* ad *Lacum Bay*, Aqua salubris, lagena una evaporizata, relinquit salis subfulci, albescens. *Ñij*.

35. *Therma Calida* ad montes *Buraguen, Paynan & Paracale*.

II. *An Account of an Experiment, touching the Quantity of Air produced from a certain Quantity of Gunpowder Fired in common Air; by Mr. F. Hauksbee, F.R.S.*

I Took a fine Glas Tube about 36 Inches long, the Diameter of its Bore about three quarters of an Inch: Its upper Orifice had a Brass Ferrel solder'd to a Screw cemented on it, to which was screw'd a Cock. The lower or bottom part was naked and open (without the Bladder made use of when I made the Experiment before the Society, for I since found that to be needless): near the upper part of this Tube within, was fixt a piece of Cork, notch'd on its Edges, to give the greater liberty for the Explosion to vent itself. The Cork had a small Cavity in its middle, the better to receive and hold the *Gunpowder*, which was let down on it, through a small Glas Funnel, before the Cock was screw'd on. In this manner the lower Orifice was plung'd under the Surface of a Vessel of Water; the Cock being then screw'd on and open, it was easie, by sucking at it with ones Mouth, to remove the inward Air, whereby the Pressure of the outward Air would raise the Water in it to any determinate height. The Tube before being measured by an accurate Cubical Inch, and graduated by a File on its outside. When the Water had ascended to the design'd Mark by the prementioned Means, the Cock was turn'd, which suspended it there: Then the Focus of a burning Glas being cast on the Powder, it soon fir'd, blowing the Wa-

ter down violently, but suddenly rising again, rested so much below the Mark it stood at before firing, as was equal to the Quantity of seeming Air produced from it. The quantity of *Gunpowder*, used in this Experiment, was one exact Grain Weight; and I found the quantity of space the Water had deserted, just after the Explosion, was equal to the bulk (nearly) of a Cubical Inch of *Gunpowder*, whose Weight was 222 Grains: So that 222 Grains Weight of the same Powder, as soon as fir'd, seems to produce something to possess the space of so many Cubical Inches of Air. Now whether the space deserted by the Water is possess'd by a Body of the same Weight and Density, or is of the same quality of common Air, I dare not determine; Since an Experiment I have lately made, to try how much the heat produced by the Explosion of the *Gunpowder*, might contribute to the largeness of the space dispossest'd by the Water, seems to conclude it otherwise. For I found that when the *Gunpowder* had been fir'd an Hour, the Water had ascended about $\frac{2}{5}$ of the whole deserted space, which was in length about $2\frac{1}{4}$ Inches, and was equal to about a Cube Inch in quantity: The space in length was divided into 20 equal parts; at two Hours after firing, it had ascended near $\frac{3}{4}$ of the same. By that time I judg'd it might become of an equal degree of Temperature with the outward Air: But still continuing the Experiment, I found (to my great surprize) that two Hours after the last Observation, the Water had reach'd to about $\frac{7}{8}$. Next Morning, which was at about 18 Hours distance, I took notice it had arrived to near $\frac{1}{2}$, or half of the first deserted space. Thus continuing rising, I found that at the end of 12 Days, the Water had ascended something above $\frac{1}{2}$ of the same. At 18 Days it had arrived to 19 of the 20 parts at first deserted; and at that Station it continued without alteration for 8 Days: So that the seeming real Air, produced

duced from the fir'd Grain weight of *Gunpowder*, was equal but to the bulk of 11 Grains of the same; that Number being nearly the 20th part of 222, the Number of Grains contain'd in a Cubical Inch, as aforesaid. Which shews that the whole space at first deserted by the Water upon firing the *Gunpowder*, was not supply'd with real Air. The Temperature of the Air I all along considered, and found it contributed nothing to this odd Phænomenon, which how to account for I know not; I only suggest, that the Springs, or Constituent parts of the Ambient Air, as well as those contain'd in the Body of the *Gunpowder*, may, upon firing, be capable of being broken, or at least so Distended, as to possess so large a space, and require so long a time to recover their Natural State again. And this, I presume, could never have been discover'd but by the confinement of the same Air in which the Explosion was made.

And as this Discovery is altogether new, so the Application of it may be as useful. But I shall wholly leave that to this Honourable Society, who best know how, most aptly to apply it.

Notwithstanding the Account of this Experiment seems to Run-counter with the Accounts formerly given of the firing of *Gunpowder* in *Vacuo*; yet considering the different Mediums in which the Experiments were made, they may be the easier reconcilable: For when the *Gunpowder* was fired in so thin a Medium as the near approach to a *Vacuum*, that then the remaining Air in the Receiver could suffer by the Explosion, but in proportion to the Quantity, which must be so inconsiderable, as not to be taken notice of. Besides, when I come to repeat those Experiments, I doubt not but I shall discover some Occurrences that were then past by unheeded, that may render them more agreeable to this last, than they now seem to appear.

III. *An Experiment shewing, that the Springs or Constituent Parts of Air are capable to suffer such disorder, by a violent impulse, as to require time to recover their Natural State ; by Mr. Fr. Hauksbee, F. R. S.*

THE foregoing Experiment, being so very odd in its appearance, gave me the Curiosity to enquire a little farther into the matter of Fact, and to try whether Air could be capable of being Wounded, (if I may call it so), or to suffer such a disorder of Parts, by a violent impulse, as to require time to recover their Natural State : I devised the following Experiment.

I took my Condensing Engine, (which is so well known to this Society, I shall not need to describe it here) ; into the bottom part of its Brass Receiver I put about half a Pint of Water ; then the upper part being screw'd strongly on, I threw into it, with the Syringe, about 3 or 4 Atmospheres of Air (as near as I could guess), suffering it to remain in that state sometime more than an Hour ; then letting out as much of the Air (by taking off my Syringe) as would readily depart, I immediately screw'd on in its Place a Box of Leather Collars, through which pass a small Glass Tube, whose lower Orifice was plung'd under the Surface of the included Water. I found in a very little time the Water had ascended in the Tube near a Foot, and continued rising

rising for some time, till it had reach'd near 16 Inches ; which plainly shews, that the Springs of Air, by being somewhat over bent, do not presently (altho at Liberty) recover their Pristine State. And were they to suffer a more violent compressure, and to remain for a Week, Month, or a Year, in the same State, I doubt not but according to the length of time, and degrees of Condensation, a proportional time would be requir'd to recover them to their Natural State again. But what is the Force made use of in this Experiment, in comparison to that of Fir'd *Gunpowder*, where the suddenness, and violentness of the Impulse, is unaccountable ; however, it serves well to confirm the Suggestion I had, that Air might so suffer in its Parts by Force or an Unnatural Extention of them, as to require time to recover their Pristine Natural State.

Upon a Repetition of the same Experiment, only the Condensed Air remained in the same state, as at first injected, for about 18 Hours : then letting out the Air as before, the Premention'd Box with its Tube was screw'd on ; and upon Observation I found, that as the Springs of the Air did unbend themselves, so they press'd more and more on the Surface of the included Water, which rais'd it higher and higher in the Tube, as they approach'd nearer their Natural State. This continued for about 6 Hours, at which time the little Tube was accidentally broke, and our farther Observations for that time frustrated.

IV. *Part of a Letter from Dr. Archibald Adams of Norwich, to Dr. Edward Tyfon, Fellow of the College of Physicians and Royal Society ; concerning a Monstrous Calf, and some things observable in the Anatomy of a Human Ear.*

I Have made what search I could about that Monstrous Calf, and I find that its Dam was all that a Poor Man had, who finding his Cow unable to cast her Young, employ'd his Neighbour to assist her ; this Man not thinking of any such Rarity us'd such violence upon the Monster, that he disfigur'd the Head in pulling it from the Cow ; notwithstanding it liv'd three Hours, and in all probability had lived till this time, if the Assistant had made use of the best Method in that case, and so by destroying the Owners All, might have sav'd him an Estate : then it Dy'd, and being Rip'd up was found, to the best of my Information, to be in all respects like any other of the same kind, excepting the Wings, which to me seem to be Bags formed out of the Membranes, torn and distended from the adjacent parts, and by fresh supplies from the circulating Fluids were enlarg'd to the bigness you now see them in. Whether the Substance contain'd in these Baggs was Fibrous and Muscular, or only a heap of Vessels inclosed in a *Cystis*, like the *Placenta*, The Assistants Ignorance, and the distance of time and place, it being three Years ago, make me incapable to account for : The place is called *Wolterton* in *Norfolk*.

[*The Skin of this Calf is now in the Repository of the Royal Society in Gresham-College, given to the same by Dr. Adams.*]

Give me leave to write one thing which to me is altogether new. The boney Cavity of the Ear is covered at each end by a Membrane ; the former is called the Membrane of the Drum, and the other is directly opposite to it ; the outer is stronger than the inner, so I call them with submission. They are joined together by the handle of the *Malleus* adhering to the outer, and the upper part of the Stirrup to the inner, which by the intervention of the *Incus* and the Orbicular Bone make a Chain, and they seem to be acted and re-acted by these small Bones reciprocally.

Whether Artists had any respect to this Original, when they first devised Drums, I cannot say ; but nothing can more nearly represent the Natural than the Artificial does ; the Skins of this answering to the Membranes of that, the Wooden Cylinder to the Boney Cavity ; the sound of the Drum would be flat without a Hole in the side, and Nature has given a passage from the Palate to the Ear. The Skins of the Drum would lessen the sound, if they were not kept on the stretch ; so would those of the other flag, if the handle of the Hammer and the Stirrup keep them on not the Tense.

This inner Membrane is closely stretch'd before the Labyrinth, the *Foramen rotundum*, and the passage into the *Cochlea*, (I omit the *Foramen Ovale*, because the Foot of the Stirrup exactly shuts it), that so the sound may be the bigger upon its approach to the Nerves. The Stirrup is generally broke in dissecting the Ear, particularly that Cover which goes over the Bone on each side ; but if it be carefully open'd, the Stirrup is entirely cover'd with a Membrane, which forms a Cavity flatly Oval, and the inside is Excavated.

Norwich, December, 18, 1706.

V. An

V. *An Extract of a Letter to his Excellency Signior Francisco Cornaro, Ambassador from the Republick of Venice, to the Queen of Great Britain, &c. By Anthony Van Leeuwenhoek, F.R.S. Containing Microscopical Observations of the Salts of Pearls, Oyſter-shells, &c.*

I Thought it my Duty to teſtifie my Thankfulneſs by theſe few Lines, and therewith to join ſome of my poor Observations, &c.

Pearls are preſcribed as a very whoſome Medicine upon divers occaſions, to all thoſe that are able to pay for them.

Now in order to make a Trial of the ſuppoſed Vertues of *Pearls*, I took ſeven little ones, all which being laid in a row together, did not exceed the length of an Inch. Then I put them upon a *Silver-Smiths* Charcoal Fire, and made them Red-hot; after which I threw them into clean Rain Water, which cauſed them immediately to burſt in pieces; whereupon I took the *Pearls* and put them into a Glaſs Tube, and placed the Tube and *Pearls* over ſuch a ſharp Fire that they were both Red-hot. Upon the burſting of the *Pearls* there aroſe a Smoke, and there was alſo a yellowiſh Oyl drawn off from them.

Thoſe Oily Particles ſtuck upon the ſides of the Glaſs in divers places, and were divided into ſuch exceeding ſmall Globules, that ſeveral Thouſands of them together did not amount to the bigneſs of a ſingle Grain of Sand; but in other places the Particles of Oyl were coagulated into much larger Figures. When

When the Glafs Tube where the Pearls lay began to melt, I threw thofe pieces of them that were burft with heat into clean Rain Water, and after they had been feveral Hours in the faid Water, I poured it upon a clean Glafs Plate, that it might evaporate; and that being done, I difcovered abundance of Salts that were coagulated in Rose-like Figures of feveral Magnitudes, and each of them different, infomuch that I could not prefcribe any particular figure, only that I faw afterwards lying a great number of very flender and long Salt-Particles, fome of which exceeded the others both in thinnefs and length; upon another Glafs there were a great number of Salt Particles coagulated in Figures like Branches and Boughs of Trees, which was a very agreeable Object, but there was nothing more remarkable therein.

I took about two thirds of the faid Water and mingled it with one third of my Blood, which I drew out of my Thumb with the prick of a Needle; and having fo mingled it, I placed it before a Microfcope, but could not difcover that the Globules of Blood were coagulated in any other manner than when Blood is mingled with common Water.

The pieces of *Pearl* that came out of the Glafs, and had been thrown into the Water, as is before mentioned, were not White, but Blackith; whereupon I caufed the Water, in which thofe Fragments lay, to evaporate, and they being dry, I put them upon fuch a ftrong Fire of Charcoal, that they turn'd White again; whereupon I threw them again into clean Rain Water, and thereupon obferved, that a great many Particles of them feparated themfelves from one another, and funk to the bottom, in appearance, like white Chalk.

Thefe Fragments of *Pearl* having lain a little time in Water, I obferved a Scum to overfpread the fame, which in my foregoing Obfervations I had not feen; and after a few Hours, that Scum grew thicker, and then I per-

ceiv'd that it was nothing else but the coagulated Salt Particles, the figures of which at that time I could not discover ; from whence I concluded, that the Salts, of which *Pearls* are partly composed, cannot be dissolved but by a violent Fire, or in strong Waters, and that *that* Heat that I had brought upon the *Pearls*, when they were in the Glass Tube, was not strong enough to separate the Salt Particles.

I took a drop of Water, which was very clear, from under that Scum that I told you before was composed of the Salts of *Pearls*, and I put the same upon a clean Glass, and observed in the space of two Minutes, that there was, as it were, a new Scum drawn over the said Water.

The next Day this Water was wholly evaporated, and where it had lain thickest, there was nothing to be seen but a white Matter, as it appeared to the naked Eye, but in reality, there was an incredible number of exceeding small Salt Particles, which for the most part were so strongly coagulated, that there could be no particular Figure discovered in them, but where the Water had lain thinner, there the Salt Particles were coagulated in the form of Boughs and Branches of Trees.

Now, forasmuch as the Water, in which those burnt *Pearls* lay, was mostly evaporated, I put some fresh Water upon them to try whether the Salts would not coagulate in larger Figures.

After this Water had been about a Minutes time poured upon the *Pearl* Particles, and that I judged them to be sunk to the bottom, the Superficies of the same Water was again covered with another Scum.

I then took a little of that Water also, as clear as I could, from under the Superficies of it, and put a little thereof upon two very clean Glasses, and presently discover'd a new Scum spreading over the same, which according

according to all appearance, was nothing else but the coagulated Salts.

After that the burnt Fragments of *Pearl* had been infused in this Water two or three Days, I discovered a few large Salt Particles, like the first mentioned Salts, and of divers Figures, some of them were as clear as Chrystal; and I could likewise perceive in some of the small Salts, that lay at distance from the rest, their particular Figures, and they also were as clear as Chrystal, but where they lay thicker together, they appeared to the naked Eye to be nothing but a white Matter.

After these burnt *Pearls* had laid about five Days in the Water, their Salts had such an influence upon *Copper*, as to turn it Green in several Places.

In order to be further satisfied, I took some of the abovementioned *Pearls*, and folded them in a thick Post Paper 4 times double, and beat 'em upon an Anvil to Powder; then I put the Powder into a little clean Copper Porringer of a Hemispherical Figure, and poured clean Rain Water upon the same, then set it over the Fire and boiled it till two thirds of the Water were evaporated.

I took some of the Water, and put it upon clean Glass Plates, in order to see how far the *Pearl* Powder had impregnated the same with its Salt Particles.

After that this Water had stood some Hours, it seem'd to me as if there was something floating upon it, but when I view'd it with a Microscope, I could not judge it to be any of the Salt Particles, but rather small whole *Pearls*.

The Water that I had placed upon clean Glasses having been exhaled, I view'd the remaining Particles with my Microscope, and saw several exceeding small Salts, of the same Figure with the former.

For further satisfaction, I caused the said Copper Porringer to be well cleaned, and poured in as much Rain Water, as had lain upon the broken Pearls, and then set it over the Fire again, and boiled it till two thirds were wasted ; then I put the same Water upon clean Glasses in order to evaporate, to the end that I might see whether there were as many Salt Particles in this Water, as there were in that, wherein I had infused the Powder Pearls, but the difference was so little that it was not worth naming.

But as the Salt Particles of both the last mentioned Waters were so soft, that when they were coagulated in dry Weather, my Breath alone was sufficient to reduce 'em to a Watry Vapour; on the contrary, the Salts that were coagulated from the burnt Pearls, were so inflexible, that I imagined, they could not be dissolved any other way, than by Fire, or very sharp Waters.

Now since we see, that notwithstanding the boiling of Pearl Powder in Water, so few Salts are extracted from it, that its hardly worth the speaking of ; we have a great deal of reason to believe, that the Stomach and Bowels have a much less power over the Pearl Particles that are given to Sick Men ; and as for what belongs to the Salt Particles, wherewith the Water is impregnated by burning of the *Pearls*, and which coagulate in the Water, like a petrified Matter, we ought to believe, that those do rather prejudice than profit our Bodies ; and the more, because the Juices, that remain in the Stomach and Bowels, do so coagulate the Salts of those Meats and Drinks which we make use of, that few or none of them mingle themselves with the Blood, but are discharged with the rest of the Excrements; and those Salt Particles, which do not coagulate, we ought for the most part, to look upon as bad as Poison, and especially those which put our Bowels into such a motion, as to protrude the Chyle too hastily : This is plainly seen in
the

the Sea-fishes, which tho they swim in Salt Water, and always receive the same into their Stomach and Bowels ; yet none of the Salts mix with their Blood, but coagulate in such a manner in the Stomach and Guts, that they assume the figure of Diamonds, and pass through their Bodies, together with the Excrements.

In short, we may conclude, that *Pearls* are useless, and that there is no manner of advantage to be had from them in the way of Medicines, and consequently that they are good for nothing else but to empty Rich Mens Pockets of their Money ; and I must needs own that I have the same opinion of Gold too, tho I have often heard that mightily cry'd up by some People, and so again is Silver by others.

But those that have dissolved Gold and Silver, and know how they coagulate again, and consider moreover, that Gold is 18, and Silver 10 times heavier than our Blood ; they know, that altho Gold and Silver could enter into the Blood, (which yet is unconceivable,) it can never be assimilated or mingled therewith ; now if this be true, 'tis plain that the aforesaid Mettals do only serve to enrich those that prescribe them.

To return again to the business of the *Pearls* ; I view'd them again with my Microscope, and observed that the scaley Particles, of which the *Pearls* were composed, were much thinner than they had appeared before.

I imagined also, that in some of the *Pearls*, I could see the very place, where they had been joined to the Shell, and at which they received their Nourishment and encrease, vvhich I suppose to happen after the same manner, as the Gall-Nuts are produced upon the Leaves of *Oaks* ; that is to say from a superfluity of Matter, or else from Wounds or Obstructions in the Vessels.

Novv, since *Pearls* are produced as it vv ere accidentally (and after the manner abovementioned) in the Shells
of

of *Oysters*, there is no doubt but that they have one and the same Salt Particles, and consequently that their Operations are uniform.

For my farther satisfaction, and for want of those *Oyster-Shells*, in which *Pearls* are found, I took two Shells that had been for four Years together nailed upon the Bulk, of a Man that sells *Oysters*; upon a supposition, that I should find no kind of Salt Particles in such Shells, and moreover, that they were as dry as the *Pearls* themselves.

The biggest of those *Oyster-Shells* I judged to be six Years Old, and that the thickest part of it was something more than one sixth of an Inch.

I split this *Oyster-Shell*, and observed several Scaley Particles of it to be of a shining whiteness, something like what we call *Mother of Pearl*; and when I view'd these Particles with my Microscope, I observed that the little Scales, of which the *Oyster-Shell* is composed, to be as thin as those that *Pearls* consist of.

Yea, I judged that the Scaley Particles of the *Oyster-Shells* lay as many times upon one another, as the *Oyster* was days old: In another place instead of Scaley Particles, there was nothing but (as it appeared to the naked Eye) a white Chalkey Matter.

These Scaley Particles are composed of exceeding small Vessels, by which they certainly receive their increase from the Fish, and which extend themselves so many several ways, that it was impossible for me to follow them with my Eye: Now, as I said before, it is possible that from an over-flowing of Nourishment, &c. there may be such a matter protruded, as shall afterwards be coagulated and turn it self into a hard Globular Figure.

Moreover, I took some of the inmost split Particles of the *Oyster-Shell*, which were very clean and white, and put them upon a Fire of Charcoal, and having made them

them glowing hot, I threw them into clean Rain Water, whereupon the Particles of the Shell were separated from one another, and appeared like Meal or Ghalk ; and presently after, I observed a Scum overspreading the Superficies of the Water, which increased and grew thicker from time to time, and which plainly appeared to be nothing else than the coagulated salt Particles ; and when this Water had stood three Days, there was such large salt Particles coagulated, and composed of so many several Figures, and so clear, that 'twas a Pleasure to behold them ; and tho after that time, by stirring and breaking that Scum, I had caused it to subside to the bottom of the Water, and had poured more fresh Water upon the said Particles of the *Oyster-Shell*, there succeeded quickly after a new Scum, but it was not near so thick as the first.

Now if the common *Oyster-Shell* has such an Analogy with the Particles of *Pearls*, we cannot doubt but that Shell which produces *Pearls* has yet a much greater likeness, so that we may well conclude, that *Pearls* are of no real use in Physick ; and who knows, that most of those Physicians who put such a value upon *Pearls*, *Gold* or *Silver*, with respect to their use in Medicines, did ever set themselves, to make a nice enquiry into the Powers of them, but only contented themselves with a servile imitation of others.

Furthermore, I took some of the inmost parts of the said *Oyster-Shell*, and proceeded with them after the same manner as I had done before, with the broken *Pearls* ; that is to say, I boiled them in Rain Water, and observed likewise that the said Water had no Scum upon it.

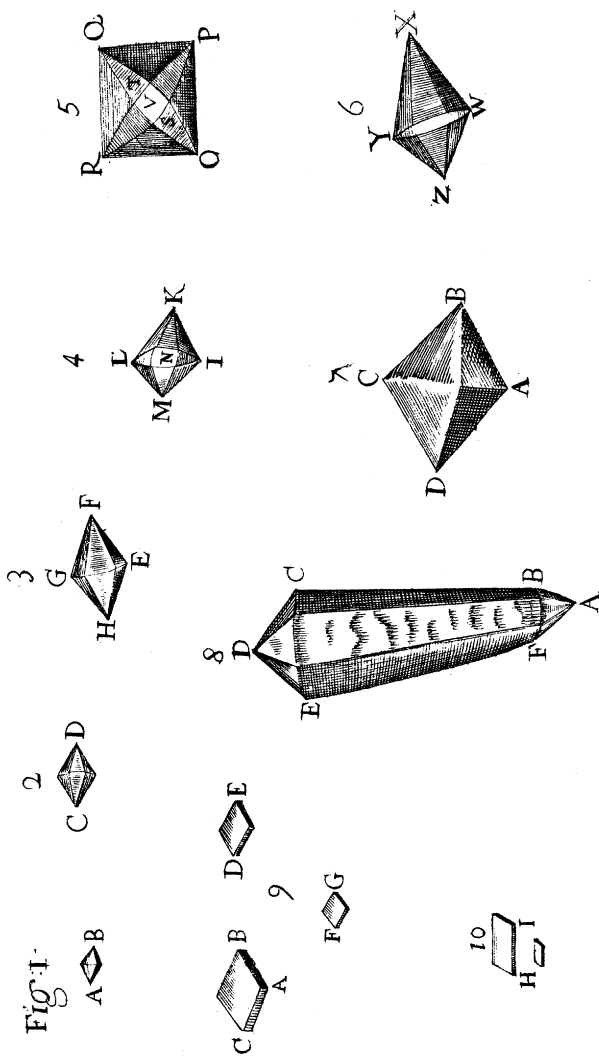
I caused this Water to evaporate, and then observed more salt Particles in that than in the Water above mentioned ; and these Salts were so soft, that my warm Breath alone was sufficient to turn them into a Vapour.

The *Heer Peter Valkenier* had presented me formerly with a large piece of an *Oyster-Shell*, which was found upon the high Mountains of *Switzerland*, where it had lain, in the Opinion of some Persons, ever since the Flood ; this Shell was not White, but rather of a dark Grey ; it had been scaled or worn away very thin, and in the Cavity where the Fish lay, there was a little piece of another *Oyster-Shell*, as it were cemented to it, and when I separated it with some violence, there lay a yellowish Clay in several little Holes or Pits in the *Oyster-Shell*.

I broke off a little piece of the said Shell, and making it red hot, threw it into clean Rain Water, and then observed that most of the Particles, that were separated from one another, were like a white Chalk ; and I could perceive in the space of a Minute, that upon the Surfaces of the Water there was an exceeding thin Scum, which from time to time grew thicker, and which I separated several times from the Water ; but it appeared to me to be nothing else than coagulated salt Particles, which after two or three Days time were not only grown much larger, but in some few of them I discovered as exact figures, as I mentioned before in the first *Oyster-Shell*.

Now, since an *Oyster-Shell*, had lain so many Years in the Earth, and remained there without being disposed to Corruption, 'tis plain that the preservation thereof was owing to those fix'd salt Particles, of which it was partly composed, and which could be no otherways divided than by Fire.

Delft, December 18, 1705.



VI. *Part of a Letter written to Signior Antonio Magliabechi, by Mr Anthony Van Leeuwenhoek, F. R. S. concerning the Particles of Silver dissolved in Aqua Fortis, &c.*

Delft, March 12. 1705.

I Take the liberty to acquaint you, Honoured Sir, that I communicated to you some Months ago my Opinion concerning *Diamonds*; the sum of which was, that they do not grow bigger by lying in the Earth, but that their magnitude and figure is assumed at once, and at the very time of the coagulation or coalescence of the Particles which compose them.

I was the more confirmed in this my foregoing Opinion, by putting Silver (which I have done several times) into a Glass Tube, that was about the thickness of my Finger, and length of my Hand; upon which Silver I poured as much *Aqua Fortis*, as was sufficient to dissolve it.

I put this Glass Tube, which was a third part filled with *Aqua Fortis* impregnated with Silver, into a Pot filled with Sand, and placed it almost Horizontally, and so as that it might not stir any way, in hopes that I might the better observe, (after a few Days,) the coagulating Particles, subsiding to the bottom, all along the length of the Tube.

Having view'd this Glass Tube with a *Microscope*, I observed divers small long Particles coagulated, which I judged to be Particles of *Salt Petre*; for as I turn'd the Tube a little before my Eyes, and as gently as I could, I put those Particles into a little Motion, and thereby at once discover'd three sides of them, which I imagined to

be the half of those Bodies, and consequently that they were of an Hexangular Figure; they appeared also as clear as Chrystal.

I saw a few long Particles, some of which were inclining to a Red, others to a Peach Colour. I further observed exceeding small Particles, that had the figure of polish'd pointed *Diamonds*; others were coagulated more irregularly.

Hereupon I took a second Glass Tube, and proceeded therewith as I had done with the former, and let it lie longer, and put a little Fire under the Pot that was filled with Sand, to the end that I might cause the said Diamond-like Particles to coagulate more largely.

After that, I poured the said *Aqua Fortis* gently out of the Glass Tube, so as that the coagulated Particles might remain in it; and then I turned the Tube with the Orifice downwards, that all the moisture might drain out of it.

Having done thus, I view'd the Tube through a *Microscope*, and saw that there stuck a great number of Chrystalline Particles on the inside of the Glass, of which several were an hundred times bigger than those which I had observed in the first Glass; then I separated with a small Copper Wire the Particles that lay together, in order to distinguish them the better, and saw with great amazement the abovementioned Chrystalline Particles, lying together like a heap of *Diamonds*, all of 'em as it were of a Hexangular Figure, and having each of them two sharp Hexangular Points; they were of several Magnitudes, and in one place we saw them scatter'd, in another lying on a heap. In a word, it would have been impossible to have disposed any real *Diamonds* before the sight of our naked Eyes, after such a manner, as to exceed this Phœnomenon.

I could not then discover among these wonderful coagulated Silver Particles, that had assumed a Chrystalline Nature, any *Salt-Petre* Particles: I shew'd them to several

ral Gentlemen, who view'd them with great Attention ; among the rest there was a *Jeweler*, who seem'd to be struck Dumb at the sight, and said, that it would be impossible for any five Mouths to declare the Wonders that he had seen.

Now, to be more sure that the abovementioned coagulated Chrystalline Particles were real Silver, (tho I made no doubt of it my self) since *Salt Petre* and *Copperas*, from whence *Aqua Fortis* is Distilled, do never produce such Chrystals, at least in all Observations that ever I made of them ; I took some of those Chrystalline Particles, and laid them upon a piece of Wood-Coal, and with the flame of a Wax Candle, which I blew upon them, put them into such a Fusion, that they presently became round Globules, which Globules were plain visible Silver.

Hereupon I sent for a *Painter*, who in his Youth had also been a *Silversmith*, and caused him to view those Chrystalline Particles thro a *Microscope*, and when I had told him what it was that he had seen, he burst out into this Expression, *Good God ! What Wonders are these ?*

I made him draw one of those Silver Particles of the same size with those, whereof I had discover'd great multitudes in my first Observation ; see Fig. 1. between A and B.

As also another Chrystal Particle represented by Figure 2. C.D.

Figure 3. EFGH. shews you another Chrystalline Particle as it lay just opposite to the sight, wherein you might observe at EG the beginning of the slanting of the six sides which end in the points of F and H.

Fig. 4. IKLM is likewise a Silver Particle turn'd into Chrystal, in which one would imagine that one saw between K and M (as it is describ'd at N) a Quadrilateral plain or flatness, and that IN and NL, parts of the little Chrystal, were also flatish ; and this appears more visibly

still in Fig 5. where the Quadrilateral flatness is described by V between S and T, but you must suppose that the difference of this and the foregoing Figure is only caused by the Objects not being placed directly before the sight, so that one could only see them the shortest way ; for if you suppose that both the Divisions, as they are described by PSR and PTR, are those parts which are both of them placed in the middle of the Chrystal, and that from thence the Hexangular slantings which formed the point described by O and Q take their beginning, the flats which one supposes to see at PV and VR are only occasioned by the undermost parts, which upon the account of the Transparency of these Figures are seen thro' em, and so represents a flatness, which in reality does not exist : For let us imagine that *that* part of Fig. 5. represented by O, were placed next the sight, the divisions of that Figure described by PTS, and lying directly in the middle of the Chrystal, will then be the uppermost side, and PSR, which is likewise in the middle of the said Chrystal, will be the undermost.

For my farther satisfaction of these appearances, I took an Hexangular piece of Rock Chrystal, and drew two streaks upon it with Ink ; one upon that part that lay uppermost, and the other upon the undermost part, and each of them equidistant from the Hexangular upper point of the said Chrystal ; and then laying it before my Eyes, in such a Position that the shortning of it appeared next the sight, the uppermost streak seemed to lie much further from the sight than the undermost, and so between both streaks was represented a Quadrilateral flatness.

Fig. 6. WXYZ, does likewise shew us a Chrystalline Silver Particle, in which the parts that lie undermost WY make the Chrystal to appear quite otherwise than it really is: This last Chrystalline Particle did not seem to be so well formed as many of the others ; for in that Hexangular Figure, of which one could see but three sides,

sides, the point WXY seems to be much larger than the opposite point WZY ; The occasion of which, as I suppose, was that the point WZY lay undermost, and near other Chrystalline Particles, whereas the point WXY lay uppermost, and consequently admitted more freely the coagulation of its Parts.

Fig. 7. ABCD represents another Chrystal, which appeared to be an uncommon Figure to the Eye of the *Painter*.

Fig. 8. ABCDEF is another Chrystalline Particle, wherein the Hexangular side CDE is very short, like that slanting part represented by EFABC, of which FAB runs into a much shorter point in proportion than the uppermost part does ; I observed a great many other such Chrystalline Figures. Now 'tis possible that these Chrystalline Figures, which are bent a little crooked, might be so shaped at the time of their coagulating by my moving the Glafs, and laying it in such a posture as is before mentioned, and which was also probably the reason, that the pointed part FAB had assumed that form that is represented in Fig. 8.

I placed another Chrystalline Figure before the *Painter*, which was bigger than that represented by Fig. 5 ; two sides of which were encompassed with, or rather there were coagulated upon them abundance of exceeding small Chrystalline Particles lesser than those of Fig. 1. AB ; in these one could discover but one small point, so that 'twas impossible for the *Painter* to give us a full view of such very small Particles.

Not content with the aforementioned Observations, I took anew two other Glafs Tubes, something larger than the former, into which also I poured *Aqua Fortis*, and then threw in some fine Silver ; whereupon I whelmed the Glafs Tube upside down, and placed it in warm Sand, to the end that the *Aqua Fortis* should dissolve as much Silver as it was capable of ; and after that this *Aqua Fortis*,
thus

thus impregnated with Silver, had stood some few days, and the upper part was become very clear, I decanted the clear Water, and poured it off from the Silver (that still lay in it) into another Glass Tube; and turning the Orifice downwards, I kept it in that Position fourteen Days, almost always in warm Sand, in order to try whether the Chrystalline Particles would not by this means coagulate bigger, but I could not observe that they did; And as for the second Glass Tube, that fell out of the Sand in the Night and broke to pieces.

After this, I took a little of the *Aqua Fortis* that was impregnated with Silver, and having weaken'd it with common Rain Water, I put some of it upon a clean Glass, and spread it over the Glass as thin as I could; and then put upon the said Glass, a small Particle of red *Copper* no bigger than a Grain of Sand; and presently view'd it with my *Microscope*, and observ'd, that the Silver Particles were coagulated out of abundance of almost invisible Particles in the said Water; and tho I view'd those Particles with a Glass that magnified them as much as possible, yet they were unconceivably small, that I could perceive nothing else, but that these slender Particles were made up of other Particles yet smaller; but tho I observed them never so nicely, I could not discover their Figures, even after their coagulations.

Now as we see these small Chrystalline Particles (which are really Silver) coagulated into such exact pointed Hexangular Figures, just as if they were so many polish'd *Diamonds*, and that these Figures grew larger and larger; we cannot doubt but that those Chrystalline small Particles have the same form, even before they are obvious to our sight.

Now, let us compare the coagulated Silver Particles, which are all of 'em, as it were, changed into Hexangular Chrystalline Figures, with the pieces of Rock Chrystal, which are likewise all Hexangular, and we shall observe,
that

that the first coagulations of the Rock Chryſtal are exceeding ſmall as they are congealed out of the Air; and from time to time, ſo long as that matter is in the Air, it preſerves the Figure which it had in the beginning, unleſs it be hindred by other Particles lying about it, as we may in ſome manner obſerve in the coagulated Silver Particles, which tho they have lain ſome Months within the Glaſs wherein they were coagulated, during a very Rainy Season, yet I could not diſcover the leaſt alteration in them.

Now it ſeems very ſtrange, that moſt of the Rock Chryſtals are Hexangular, and end in an Hexangular point; and tho ſome of them are ſlanting and almoſt flat, where they are joined to the Rock, yet one end or point of them is likewiſe Hexangular; But when we ſee with our Eyes *Salt-Petre* diſſolved in Water, and united with it, and afterwards coagulating therein, we ſhall diſcover all the exceeding ſlender and long Particles thereof to be of an Hexangular Figure, excepting ſuch which coagulating in a heap together are irregular; and as the Chryſtals end in an Hexangular point, ſo the ends of theſe *Salt-Petre* Particles run into a flattish or *Beetle-like* Figure.

So we daily ſee in coagulated Sugars, that we call *Sugar Candy*, moſt of their Particles to be of a Quadrilateral Figure, of which two of the oppoſite ſides are often broader than the other two, and that the ends of them, when they don't ſtick to other Sugar Particles, run into a ſharper *Beetle-like* Figure.

In ſhort, we ſee that the coagulated Silver Particles appearing like Chryſtals are all of them Hexangular, and end in two ſharp points, and that the Rock Chryſtal is almoſt always of the ſame Figure; and moreover, that *Salt-Petre* does alſo coagulate into Hexangular Figures with a *Beetle-like* ſharp point; but why ſome coagulate one way, and others another, is a thing unconceivable in my Opinion, and which can no ways be accounted for.

I did

I did likewise put a little Gold into *Aqua Regia*, and placed the Tube, in which the said Water and Gold was, in warm Sand, to the end that as much Gold as was possible should be dissolved ; but I could observe no coagulations in it, but only in some Particles branching out, the Figures of which, by reason of their smallness, I could not perceive. But as to the mingled Salts, of which *Aqua Regia* is composed, viz. Salt-Petre, Vitriol, and Sal Almoniac, I saw abundance of their Salt Particles coagulated ; all which had the figures of exact square *Diamonds*, having two sharp and two obtuse Angles ; they were of different Magnitudes, some so small that they were hardly to be perceived with a *Microscope*, most of 'em as clear as Chrystal, excepting some very small Particles that lay upon them which had no transparency.

Fig. 9. Three of those *Diamonds* of several sizes are represented by ABC, DE and FG, in which we could perceive a thickness, and the *Painter* has described it accordingly : We saw likewise some few Oblong four-sided Figures, with two acute and two obtuse Angles, as in Fig. 10. HI.

I imagined that in the abovementioned Figures there was no Gold at all, because I scarce ever discover'd any such Figures in *Aqua Fortis* impregnated with Silver.

There lay moreover upon, and about the said *Diamonds*, long Chrystalline Figures, which I conclude were Particles of Salt-Petre.

VII. *An Account of a Book, Intituled, A Voyage to the Islands of Madera, Barbadoes, Nieves, St Christophers, and Jamaica ; with the Natural History of the Herbs and Trees, Four-footed Beasts, Fishes, Birds, Insects, Reptiles, &c. of the last of those Islands. To which is prefixed an Introduction, wherein is an Account of the Inhabitants, Air, Waters, Diseases, Trade, &c. of that Place, and some Relations concerning the Neighbouring Continent and Islands of America. Illustrated with the Figures of the Things described, which have not been heretofore engraved, in large Copper Plates as big as as the Life. By Hans Sloane, M. D. Fellow of the College of Physicians, and Secretary of the Royal Society. In two Volumes in Fol.*

The First Volume.

THE Author of this Work, having, as he intimates in the Preface, a great desire to satisfy his Curiosity, and improve his Knowledge, by making particular Observations in some parts of the *West-Indies*, whence a great part of the *Materia Medica* is brought to us, as likewise to view and examine the things themselves in their Natural and Vegetating state, laid hold of an occasion that offered it self, and accompanied the Duke of *Albemarle* as his Physician in those Parts ; which gave him an opportunity of making these Remarks, which he has obliged the Inquisitive with in this Volume, which contains but one part of the designed Work of *A Natural History of Jamaica* ; nor is it wholly confined to that Island, since he inserts several curious and useful Observations in other adjacent Parts, as he had any convenience of making them.

In the Preface he tells us of an Indisposition during the most part of his Voyage thither, that hindered his observing

several things, which otherwise we might have had an account of. Here he tells us his way of preserving the Specimens of his Plants, and owns he was obliged for the designs of many to one Mr. More, a *Clergy-man*.

This first Volume, after a large Introduction and Observations made in the Voyage thither, contains a very particular and accurate description of the Herbs growing there, with the Figures as large as the Life, curiously drawn and as well Graved. Thus far in general : I shall observe some few particulars, and refer the Curious to the Book it self for a full information.

In the Introduction he informs us of some particulars of the first Discovery of the *West-Indies* by *Ch. Columbus*, and of this Island in 1494 ; and by the way observes, that the first Ship brought home the *French Pox*, before unknown in *Europe*, with its wonderful spreading in a few Years.

As to the situation of *Jamaica*, it lies S. W. of *England* 1500 Leagues ; it has to the E. *St Domingo*, about 35 Leagues, and to the N. *Cuba*, about 20, to the S. *Porto Belo*, and to the S. E. *Santa Martha*, each about 140 Leagues distant.

Next he gives the Names of the Rivers (which are generally Rapid and Muddy) both on the N. and S. sides ; observing there is a Ridge of Hills running E. and W. through the midst of it.

As to the Barometer, he found the same variations there as with us in *England* ; with some other Observations of the Air. Then he treats of the *Waters* ; observes an hot Spring, salt Springs, &c. He found the Soil of their *Savannas* answer our *Meadows*. Treating of their Food, he observes that Flesh sometimes corrupts very soon, except Salted ; and here takes occasion to speak of their feeding and managing their *Swine* ; another part of their Food is *Turtles* and some other *Fish*. Here he speaks of *Cassada Bread*, and the wonderful change made in it by Baking, it being raw a rank Poison. Then

Then follows a Digression concerning the extraordinary power of the Stomach, in converting so many different sorts of Food into good Nourishment; with a particular account of the different Foods of several Nations and People.

Treating of their Drink, he says Water is the chief, as also the most wholesome, disapproving vinous and strong Liquors; and observes that *Cyder, Beer, &c.* brought from *England* doth not keep there: mentioning several other Drinks used there, with their good and bad effects.

Their chief Exercise is Riding in a Morning, as well as the Healthiest. Frost and Snow are never seen there, but in the Inland parts sometimes great Fogs; they have two Rainy Seasons, *viz.* in *May* and *October*.

Here follows a Journal of the Weather from *May* the 2d, 1688, to *March* the 17th, 1689. This is succeeded by an Account of the Winds, as Monsoons, &c. Earthquakes generally happen once a Year, and Thunder daily in the Mountains.

The Inhabitants are for the most part *Europeans*; some few *Creolians, Indians*, and the *Negro-Slaves*; the Natives having been all formerly destroyed by the *Spaniards*.

Then he treats of their Cloathing, Houses of the *Planters* and *Negro's*, of their *Work-houses, &c.* Speaking of the *Negro's* and their manner of living, he observes their Mirth, Singing, Musick and Dancing, with their Lasciviousness; as to the *Negro's* Physick, Cupping with *Calabashes*, and Scarifications are frequent; they know little of the use of Simples, or the Method of Curing a Disease; they have a Custom in most Cases, of daubing the Sick Person all over with wet *Clay*, and setting him in the warm Sun.

He gives some account of the Trade of *Jamaica*; and coming to speak of the Punishments of the *Negro's*, he says, tho they may seem severe to us, yet they are but necessary for so stubborn a Race of Mankind.

As to the Beasts, he observes the Horses are but small, fine-shap'd and swift, but weak ; of black Cattle there were formerly many wild, but at present there are but few, except what they breed.

Travelling the North-side of the Island, he found there the Ruines of a large City called *Sevilla*, with a Church that had never been finish'd ; here he met with an Inscription of *Peter Martyr*, &c. near this Place is a fine Harbour.

After this is an Account of Capt. *Phipps* Journal for the *Wreck*, with other Remarks.

Next follows an Account of the Diseases he met with there during his stay, and observes they are much the same as here ; he gives us the method he used in the Cure, with the Success of his Prescriptions.

He concludes with the relation of his Voyage thither, and the Observations made in the same ; and speaking of Sea-sickness, disapproves the common Practice of some to take at Spring and Fall Preventive Medicines, it often bringing on Illnesses, in probability they would never have been troubled with.

Here he gives the Description and Figures of several *Fishes* and *Birds* he met with in his passage, as the *Hirundo Marina Major*, the *Grampus*, *Porpesce*, *Caravel* a sort of *Zoophyte*, *Dolphin*, *Shark*, *Boneto*, *Remora*, *Flying Fish*, *Tropic Bird*, *Man of War*, *Booby*, *Noddy*, &c. with the Plants observed at *Barbadoes*, and the other Islands.

Lastly, follows the Natural History of *Jamaica* ; and in this Volume he treats only of the *Herbs*, which he distributes into 17 Chapters.

1. Of *Submarine Plants*, of which he describes 42, giving their Figures as big as the Life, and refers to the Catalogue of *Jamaica* Plants, publish'd by himself in Octavo 1696, where he gives the Synonyma with great Knowledge and Industry ; the same Method is observed in all the following Chapters.

2. Of

2. Of *Mulbromes*, *Mosses*, &c. in all 26.
 3. Of *Ferns* and *Capillary Plants*, in number 103.
 4. Of Herbs with Grassie Leaves, of which he names 57.
 5. Of Herbs with less perfect or stameneous Flowers, in all 52; particularly of *Long Pepper*.
 6. Of Herbs with a Monopetalous Flower, of which are 47; particularly of *Tobacco*, with its good and bad Qualities.
 7. Of verticillated Plants, of which there are but 14 that grow wild.
 8. Of Leguminous Herbs, or with a Papilionaceous flower, in all 30.
 9. Of Herbs with flowers consisting of 2 or 3 *Petala*, 12.
 10. Of Herbs whose flowers have 4 *Petala* or Leaves, 26.
 11. Of Herbs vasculiferous with Pentapetalous flowers, 25.
 12. Of Herbs which are of the Kind of umbelliferous Plants, 6.
 13. Of rough Leaved, or asperifolious Plants, 5.
 14. Of Herbs commonly accounted to have many naked Seeds, 24.
 15. Of Bacciferous or Pomiferous Plants 42.
 16. Of Bulbous rooted Plants, or with 6 or more *Petala*, amongst these he reckons the *Aloe*, of these there are 20.
 17. Of Herbs whose flowers are composed of several flowers, of which Tribe he gives 30.
- This ends the *First Volume*.

VIII. *A Letter from Mr William Baxter to Dr Hans Sloane, R. S. Secr. containing an Account of a Book Intituled, Archæologia Britannica, giving some account Additional to what has hitherto been Publish'd, of the Languages, Histories and Customs of the Original Inhabitants of Great Britain : From Collections and Observations in Travels through Wales, Cornwall, Bas Bretagne, Ireland and Scotland, By Edward Lhuyd, M. A. of Jesus College, Keeper of the Ashmolean Museum in Oxford. Vol. I. Containing; 1. A Comparative Etymology ; or, Remarks on the Alteration of Languages. 2. A Latin-Celtick Dictionary : or, a Vocabulary of the Original Languages of Britain and Ireland. 3. An Armoric Grammar. 4. An Armoric - English Vocabulary. 5. Some Welsh Words omitted in Dr Davies's Dictionary. 6. A Cornish Grammar. 7. A Catalogue of British Manuscripts. 8. An Essay towards a British Etymologicon. 9. A brief Introduction to the Irish or Ancient Scottish Language. 10. An Irish-English Dictionary. Oxford, Printed at the Theatre for the Author, MDCCVII. And delivered at the Ashmolean Museum.*

I have carefully perus'd this First Volume of Mr Lhuyd's *Archæologia Britannica, or Glossography* ; and am bold to say that nothing in this kind has appeared in Publick, within my knowledge, this Century to be compared unto it ; whether we consider the Elaborateness of the Work,
the

the Skill and Judgment of the Compiler, or the usefulness of it to illustrate the most Ancient part of our History ; and trace out the Original Inhabitants, and *Brigantic* and *Belgic* Colonies : Similitude of Languages, and of Rites and Religious Opinions, being by that great Author of Historiography, *Herodotus Halicarnassensis*, deservedly accounted the most established Rules for such Discoveries. The Ingenious and Learned Author has very candidly and truly represented his own undertaking in his *English Preface*, and in that curious Letter written to my Lord Bishop of *Hereford* ; to which I refer you. In his *British* Epistle to his own Country-men, he delivers his very weighty Reasons for altering the Vulgar Alphabet of the *Welsh* ; and justifies it from the Authority of Ancient M S S. and Inscriptions upon Stones in several parts of our Country. Next he Learnedly refutes the Opinion of the *Saxons* receiving their Alphabet from *Austin* the Monk, and shews that the same Characters are still extant on the Tomb-Stone of *Kaduan* King of *Gwynedd* in the Church call'd *Llan Gadwaladar* in the Isle of *Anglesey*, who was one of the *British* Princes in that Famous Battle of *Bangor is y coed* fought against those *Saxons* whom *Austin* had influenced to Massacre the *British Monks*. Indeed all the Sepulchral Inscriptions in Mr *Camden's* *Britania* abundantly prove the use of the *Roman* Alphabet in this Noble Province, from whence the Ancient *British* or (as now commonly call'd) *Saxon*, and *Irish* Alphabets are very small Deviations, unavoidably introduced by Time and the Arbitrary use of Writing. What he next proceeds to, seems much more owing to his Modesty than of any real necessity : I mean his excusing the time he employ'd in this great Undertaking ; for that may well seem to any Judicious and Impartial Peruser, to have rather been the product of an Age than of those few Years since his return from his Travels. What he says for putting those Four Languages into one Book is very reasonable ; in regard

gard none of these very Antient Dialects can be adjusted, but by being compared with the others. The *Scotish* Language (which by a large List of words in the *Basque* and *Irish* is here sufficiently demonstrated to be a branch of the Old *Spanish*) he shews to be intermixt with the Ancient *Gwydheleg* or *British-Irish*; as also that these *Gwydhelians* were the most Ancient Colonies of *Galls* here, and probably forced by the Ancestors of the *Britans* into *Scotland* and *Ireland*; the *Picts* being by the *British* Writers term'd *Guydhyl Fichtied*; and *Irish* words such as *Uygl*, *Ban*, *Lhuch*, *Drim*, &c. still continuing to be Names of *British* Rivers and Mountains: as also numbers of words (such as *Corlan*, *Blith* and the like) in the present *British*, whose Etymologies are only found in the *Guydhelian* or *Irish* Dialect, now disguised by the *Scotic*. This *Guydhelian* Tongue he Learnedly proves from Ancient *Celtic* words, and Names of Places in the *Roman Geography*, to have been also the Language of *Gaul*. For my own part, I must confess, I look upon our *British* (the Origin whereof he defers till another occasion) to be a Branch of that Antient *Belgic*, that was spoken by the *Galli Senones*, who possess'd all the lower parts of *Germany*, until the Invasion of the *Kimerian Saxons* or *Kimbrians* from the *Palus Maotis*, whence our *Celto-Scythæ*, or present *Germans*, of which see *Possidonius* in *Strabo*. Lastly, he does not only prove by the Authority of the *Triades*, (a small *British* Tract written according to the Judgment of that most Learned Antiquary Mr *Robert Vaughan* of *Hengurt* about a Thousand Years ago) that there was a very numerous Colony made in very early Times out of Great *Britain* into *Vasconia*; but also confirms by a large Catalogue of *British* words in the present *Gasgoin*, the mixture of both People, even there as well as in *Ireland*. His *Comparative Etymology* is so Methodically, Artfully, and Judiciously digested, so admirably projected by the best Canons as well of

Critique

Critique as of Grammar, that it recommends its self *prima Facie* to the nicest Palate, and sufficiently provides it self against disingenuous Cavillers. His *Harmonicon* in Latin, British and Irish is a Noble *Promptuarium* of all the British Dialects ; a Work of much Labour and Judgment, and which cannot but be acceptable to the Curious in Foreign Countries. It were indeed to be wish'd the whole were translated into *Latin* ; Scholars abroad having generally a greater Curiosity this way than as yet we seem to have in *England*. Father *Julian Manoir's* *Armoric* Grammar is a valuable Curiosity, and illustrates the Work ; It having scarce been ever heard of in our Country ; and the *Armoric Dictionary* added to it, supplies in a great measure the defect of the *Cornish* one promised in the next Volume. In the *Cornish Grammar* our Judicious Author seems to excel himself. You have there the History of our British Alphabets nicely and accurately handled, with a very Curious and Diverting variety of things. You have also a considerable Supplement to Dr *Davies's* Learned Dictionary. He has infinitely obliged the Ancient *Britans* of *Cornwal* by preserving their Language to Posterity, when just expiring. I cannot omit saying thus much of that Noble Dialect of the British ; that it appears as capable of Artful Management and Grammar Rules, as the most refined Languages : Indeed the *Celtic* Tongues in general seem to have been very Anciently refined, and I question not the truth of what is hinted in that incomparable Letter of our Author to the Lord Bishop of *Hereford*, that they were the very Ground-work of *Greek* and *Latin* Grammars ; not only the *Cantabrian* or *Scotic* part of our Irish, but even the Noble *Teutonic* Dialects themselves so Learnedly recommended by the incomparable Dr *Hicks* in his late *Thesaurus*, seeming but defective if compar'd as to Art and Variety with our British. The Learned World will therefore the less wonder if Father *Molloy* was able to perform so little of the Grammarian's part

in his *Irish Grammar*. The Declensions of *Nouns* and *Pronouns* I must own to be mostly upon the *British Plan*; but the Verb, which is the Ground-work or Basis of every regular Tongue, seems, as in all uncultivated Languages, wild and unaccountable. In the *Catalogue of British MSS.* our Author has consulted the Reader's time by composing it in the Order of Alphabet, with Abbreviations directing to the *Studies* where they may be seen at present; and also his advantage by distinguishing always betwixt Tracts and single Papers, and betwixt perfect Treatises and imperfect; giving a more particular account of such pieces as seem'd to deserve it, and dismissing the useless Poets of the two last Centuries with only the bare mentioning them. Nor has he shew'd more Industry and Judgment in this and the other Titles of this Work than has been (for the extent of it) successfully imitated by his Ingenious Fellow-Traveller Mr *Parry* in his Excellent *Essay towards a British Etymologicon*, where he has Modestly parallell'd the greatest part of the British Radicals with those words that seem'd agreeable therewith in any other Language; without pretending to determine the point of Precedency as to Antiquity, which has been too much the boldness of the late Learned *Monsieur Pezron*, and indeed of most other Etymologists. The *Irish Focloir* or *Dictionary* so industriously compiled by our Learned Antiquary, and supply'd with a large Appendix of omitted words from *Scotland* and *Ireland*, cannot (besides the great Service it must needs contribute to the Inhabitants of those Countries) but be judg'd of considerable use to Criticks in the *British* and *Celtic*; The *Gnydhelian* part of that Language, being that which was spoken by the most Ancient Colony of the *Celts* in this Island, and consequently containing the Etymologies of vast Numbers of British Derivations and Compounds otherwise not to be accounted for.

The singular Generosity of those amongst the Nobility and Gentry who have so liberally contributed to the Expences of the Author's Travels, in order to qualify him for so uncommon an Undertaking, has (as you know very well) besides their Names prefix'd to this Volume, been gratefully acknowledg'd in the Preface of a Latin Book publish'd during his Travels. Nor can indeed so laudable an Act be ever too much celebrated, there being no other Method of rendering one capable of such a Task, but those Travels through the remotest parts of *Britain* and *Ireland*, which he has upon that Encouragement so successfully perform'd.

One would think that in this Learned and Curious Age nothing need be urg'd as to the usefulness of preserving in Writing these Original Languages of *Britain* and *Ireland*. But yet so subject is Humane Nature to prejudice, and so apt to entertain the easie Humour of Jestings, rather than that more Thoughtful one of considering Subjects, and examining them; that I find a great many Gentlemen, otherwise very sensible and Ingenious, are at a loss herein. The use of committing to Writing these now almost Antiquated Languages is what the Author has truly hinted in his Dedication and Prefaces: Namely the tracing out of the Original Inhabitants of these parts of Europe; The Interpretation of the Names of Persons and Places in the Roman History and Geography, not only of *Gaul*, *Britain* and *Ireland*, but in a great measure also of *Italy* and *Spain*; The Improvement of such Works of Learned and deservedly Eminent Men as the Etymological Dictionaries of *Vossius* and *Menage*; the explaining such passages in the Greek and Latin Writers as relate to the Rites and Manners of the *Gauls*, *Britains*, &c. by a diligent perusal of the Ancient Poets, and such others of the Oldest Writers as are extant in these Languages. As for such as shall answer, that tho all this should be granted, yet still these are but trifling and useless

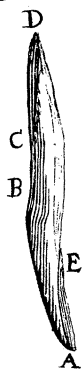
less Disquisitions; 'tis plain they speak so unlike Scholars, as not to require any further Reply.

I cannot conclude without taking Notice of one Calumny that has been whisper'd about by Men of Passion or Intreague, *viz.* That this Book is design'd to serve a certain Interest. I therefore think my self oblig'd in Justice, to certify to the Publick, that after a careful perusal of all the Parts of this Work, I cannot discern a Syllable any where that in the least tends to favour any Party, or is any way concern'd in any National Distinction; and that the Author every where discovers himself a Man of Candor and above Partiality. I have not, I confess, had the Happiness of a Personal Acquaintance with him, but I presume I may, as our Blessed Saviour directs, *Judge of a Tree by its Fruit.*

L O N D O N

Printed for *Benj. Walford*, Printer to the Royal Society, at the *Prince's-Arms* in *St. Paul's Church-yard*. 1707.

Fig: 1.



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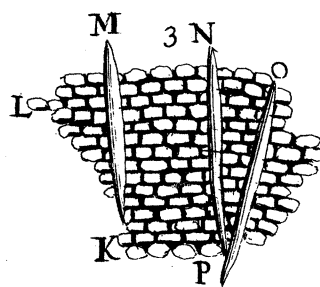
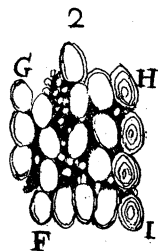
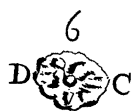
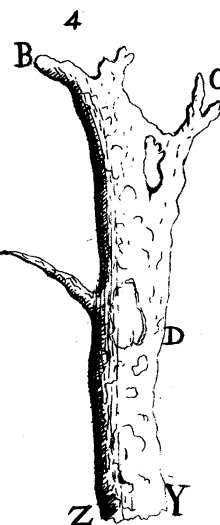
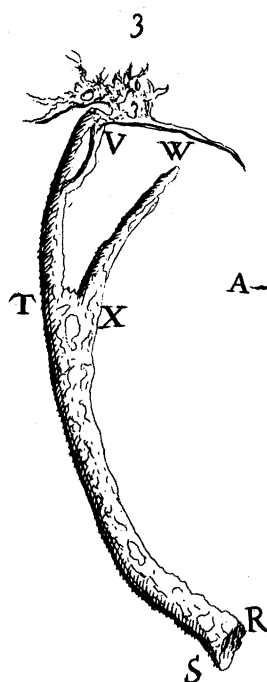
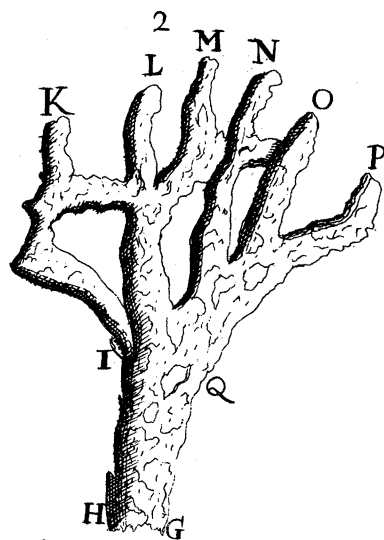
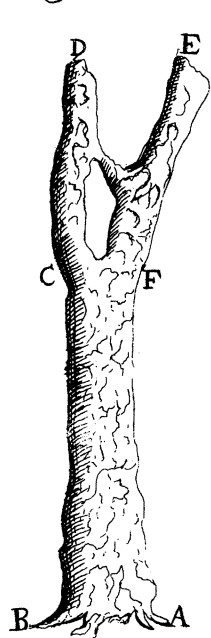


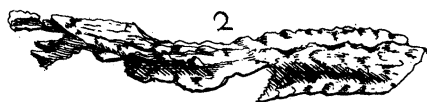
Fig: i:

Tab: 2:



Tab: 3.

Fig: I:



PHILOSOPHICAL TRANSACTIONS.

For October, November, and December, 1707.

The CONTENTS.

- I. *Microscopical Observations on the Cortex Peruvianus : By Mr. Anthony Van Leeuwenhoek, F. R. S.*
- II. *A Letter to the Royal Society, from Mr. Anthony Van Leeuwenhoek, F. R. S. Concerning the Whiteness on the Tongue in Fevers, &c.*
- III. *Part of a Letter from Dr. Scipio des-Moullins, to Dr. Hans Sloane, R. S. Secr. Concerning a Mineral Water at Canterbury.*
- IV. *An Account of the Cure of two Sinuous Ulcers possessing the space of the whole Arm; with an Extraordinary Supply of a Callus which fully answers the Os Humeri lost in time of Cure. From Mr. John Fawler, Surgeon to the Sick and Wounded at Deal, to Dr. William Cockburn, F. R. S.*
- V. *Part of a Letter from Richard Waller Esq; S. R. S. to Dr. Hans Sloane, R. S. Secr. Concerning two Deaf Persons, who can speak and understand what is said to them by the Motion of the Lips.*
- VI. *A Relation of a Deaf and Dumb Person, who recover'd his Speech and Hearing after a Violent Fever : With some other Medicinal and Chirurgical Observations. By Mr. Martin Martin.*
- VII. *Observatio Eclipsis Lunaræ peracta Bostonij Nov. Anglorum, die quinto Aprilis vespere, A. D. 1707. à Tho. Brattle.*

I. *Microscopical Observations on the Cortex Peruvianus: By Mr. Anthony Van Leeuwenhoek, F. R. S.*

I Have been many Years acquainted with the Heer *Angelus Van Wikhnyfen*, a Doctor of Physick at *Midd'elburgh* in *Zealand*, and I have a much greater esteem for him, because he has owned to me several times, (and so indeed have divers other Learned Gentlemen,) that he knew very little of the Art of Healing, and that most of his Operations were performed by simple Medicines.

When this Gentleman came to visit me last, our Discourse fell again upon the Skin or Bark of that Tree, which is called *China China*, and which is made use of with success in the most Obstinate Fevers.

Our Discourse amongst other things rolled upon this Topick, That between one Bark and another there is a great deal of difference; for in all Woods that are known to me, the Bark proceeds out of the Wood, and every Year there is produced a new Bark between the Wood and the old one of the former Year, by which means the Barks of Trees grow every Year thicker and thicker; so that at length the extreamest Bark that lies farthest from the Tree does not only receive no nourishment, but also dies, so that that which before had a taste in it becomes altogether tasteless, as I have shewn upon other Occasions; and consequently those Barks, which we call *China China*, are best when separated from the youngest Trees.

Hereupon the Doctor frankly Communicated to me, how he made use of the *China China*; adding, that he thereby

thereby infallibly cured all Fevers that were going off, and gave me leave to Publish what he told me.

He beats the *China China* to a fine Powder, and passing it through a very fine Sieve, takes two Drams of it, and infuses it into half a Pint of *French Wine*; and so gives it mingled with the said Wine to his Patient to drink; or else he takes about an Ounce or 16th part of a Pound of the said fine Powder, and puts it into a Glass Bottle, and pours upon it a Quart of *French Wine*, and so lets it stand for use: His Directions are, that about an Hour before the Fever comes upon you, you should take the Bottle and shake it well, to the end that the Powder that had subsided, may be well mingled with the Wine, which is to be divided into four Doses, and taken upon every Access of the Fever, in case it should return; and by this means, he says, hardly one in an hundred have failed of being cured.

About a Year ago, I took three or four little pieces of the Bark of the Tree called *China China*, and examined it as well as I could, but was not satisfied in my Observations; wherefore I took again a little handful of the said Bark, both of the thickest and thinnest sort, in order to examine it anew, and try whether I could have any better luck, than in my former Observations, which I laid aside, as if I had never made them.

I observed then, that the Bark called *China China* does for the most part consist of long Particles, both ends of which run into a Point, some of which, at first view, one would judge to be twice or thrice as long as the rest; but examining them more nicely, I found that they were several Particles sheathed, as it were, within one another, in such a manner, that without looking very close upon them, one would take them to be one continued Particle.

These Particles are somewhat Transparent, inclining to a yellowish Colour, and almost round.

I chose out a long Particle, which lay the length of the Wood in an Oblique Position, from among some of those that were near the Extremity or Superficies of the Bark, and caused it to be drawn as you see *Tab. 1. Fig. 1. A B C D E.*

At B is represented a small Crookedness occasioned by the Vessels that proceed from the Wood, and by which the Bark receives its increase.

By C D is represented that part upon which another of the long Particles lay, and so made a Dent or Impression therein, and the same also happened to the other end of it, described by A E, occasioned by another Particle that lay under it; but I never observed any thing like this in other Barks of Trees that I have examined, save only in that which is called Cinnamon.

I placed moreover before the Eyes of the Painter some of the said long Particles, after I had cut them asunder Horizontally, and caused him to draw a small Number of them, that you may judge how close the said Particles lay by one another in the Bark; yea, I have seen six of them lie so near one another, that you could but just distinguish the Number of them; and that which divides these long Particles from each other, is only the Vessels that compose part of the Bark, and proceed from the Wood, as I often said before, and from whence also I conclude, that the above mentioned Particles receive their increase.

Fig. 2. F G H I, represents an exceeding small part of the abovementioned Particles, so as they are cut across, whereby they appear in an Oval Figure; and if we view them very nicely we may discover, that they are composed of Screw-like Parts, as you may see in four of them between I and H.

From this Observation I supposed, that they were not at first made in an instant of time, but that they gradually receive their Increase.

I have several times cut the Bark *China China* through perpendicularly, or length-ways, in order to discover the Vessels that receive the said long Particles, and by which they are nourished ; but I could never succeed, by reason of the vast Number of the long Particles, which caused the small Vessels to break in pieces.

I steep'd some of the said Bark of *China China* in Rain Water, in order to soften it, for the outside of it is so hard that it could not be cut otherwise ; however it remained still so hard, that I could not make use of it to my Satisfaction ; but I have nevertheless observed several times, that the extream part of the Bark had no such long Particles as are described by *Fig. 1.* from whence I judged, that the said Parts were dead or perished, as is usual in several other Barks.

When I had separated the outmost part of the Bark from the rest, I discovered, that the Vessels, which mostly compose the said Bark, did not run length-ways, but Horizontally in the Bark ; and whereas in the Barks of many Trees I could discover the Yearly encrease and growing thickness, I could never but once discover the same in the *China China* ; at which time I observed, that the Vessels that lie Horizontally therein, (and are no bigger than the Hairs of ones Head,) were so close to one another, that there was not one of these long Particles described by *Fig. 1.* lying between them.

Now as the extream part of the *China China* is almost always rough and very hard, I took one of the little Barks, whose outside was smooth like others, tho' it was not of a thicker Wood, and after I had steeped it about 24 hours in Brandy, I found it much softer in the Cutting, than all the others I had dealt with before ; by this Bark I judged that it had been increasing six Years in thickness, before the long Particles represented by *Fig. 1.* were made ; and thus with much less labour I could clearly discover, that the accession or increase of six Years

thickness in the Bark, consisted in nothing else than of Vessels which were disposed Horizontally in the said Bark ; and entring a little further into the Bark, I found but very few of the above mentioned long Particles, but the further I came, the thicker they lay, till at last I found 'em as numerous as in other Barks : And whereas all other Barks of the *China China* are so heavy that they sink in Water or Brandy, this Bark which was smooth, swam, and tho' I thrust it under the Brandy yet it would emerge frequently.

Whether the *China China* be of two sorts of Trees is not now the Subject of my Enquiry, but in the mean time I judge by those pieces of Bark which I had, that they are for the most part taken from the extream part of the Bark, which is in a manner perisht, for want of enjoying any longer its nourishment from the Tree; and since as I told you before, that smooth Bark which I had steeped some days in Brandy, would not subside, but floated therein almost equal with the Superficies, one would be apt to conclude, that the heaviness of the Bark depended on the Multiplicity of those long Particles described by *Fig. 1.*

Now that you may have a true Idea of the above mentioned Vessels, I caused a small part of them to be drawn, as in *Fig. 3.* K L O P, which Vessels so described, lay very near the Extremity or outside of the Bark, and in which the Painter could discover but three long Particles K M, P N and P O.

Several Persons seeing these kind of Figures would be inclin'd to think that they were not Vessels, being unable to conceive how the Saps can be carried thro' such Oval Particles which seem to be shut up quite round ; but if they considered, that in divers Plants, and in some Woods, there are found a sort of Covers to their Vessels, which are as *Valvulae*, and serve to hinder the protruded

truded Sap from returning the same way, they would not think it so strange an Appearance.

The Microscope, which I made use of to represent this last Figure, does not magnify near so much as that I made use of for the former.

In all my Dissections of the Vessels I could not once discover that any of the before mentioned Particles were joyned to those Vessels, and therefore I imagined, or rather considered, whether those long Particles might not be Coagulated Salts.

After that I had steeped a little piece of *China China* about 24 hours in Brandy, I observed several small Particles thereof floating, but I could not discover, that any of the long Particles were lessened or gone over to the Brandy.

I did several times lay a drop of the Brandy (wherein the *China China* had been steeped) upon the cleanest Glass I could get, in order, if possible, to discover whether any of the Salts of the *China China* might be gone over to the Brandy; and every time I discovered with great Amazement, that within the space of 12 Pulses, the fluid matter, (which was otherwise very clear, saving that it inclined to a Rustet Colour) where it lay thinnest, was turned into a white Substance, and soon after the same happened to other drops that were thicker. And when I viewed this white Matter with my Microscope, I discovered an unconceivably vast Number of small Particles, insomuch that no Man would believe it unless he saw them, and where these Particles lay thickest together, they appeared to be of a Rustet Colour.

I several times laid as much of it upon a clean Glass, as would make the Quantity of a Grain of Sand, to see if it were possible the Figure of those Coagulating Particles, but they were so unconceivably small, that they escaped my sight; and as soon as I had set this fluid Matter in the

Air, and placed it before my sight, I perceived the Particles moving amongst each other; they were also in vast Numbers, and the Moisture being dried up, they assumed a White Colour.

Afterwards I infused some of this Bark in a well tasted *Florence Wine*, in which after it had lain about 24 Hours, I took a drop of the said Wine, and put it upon a clean Glass, and observed therein likewise abundance of Coagulated small Particles, but nothing near so numerous as those that appeared in the Brandy's. I could also perceive some Salt Particles in the said Wine, but when I put in some more of the *China China*, the Coagulating Particles increased, but none of the Salts which are peculiar to the Wine did then Coagulate.

I infused again a little of the Bark in Rain Water, and after a little time poured some of it upon a clean Glass, in order to its evaporating, and then observed, that a great part of it was turn'd into a Scum, but there was nothing more remarkable in it.

Moreover I took a strong Pickle, and put some of it into a Glass Tube of the thickness of a small Birds Quill, and conveyed into the Middle of that Pickle, in three distinct places, a little of the Brandy in which the *China Chine* had lain three or four days; and I observed, that the Brandy would not mingle with the Pickle, but immediately coagulated like Clouds, which Cloudy Matter, as being lighter than the Pickle, rise up to the upper parts of the Glass; and tho' this Coagulated Brandy, in which the *China China* was infused, had been ten days in the Pickle, yet was it not dissolved; and whereas the Coagulated parts, by reason of their lightness, had at first emerged, they did afterwards sink down gradually to the bottom, and tho' by shaking I moved them upwards, yet when the Glass stood still they would presently subside.

Afterwards

Afterwards I took some Pickle and mixt it with Brandy in which the Bark had lain about eight days, and poured some of it upon two distinct Glasses, and then observed that as soon as the said Brandy was mix'd with the Pickle, the mingled Stuff assumed a whitish Colour ; and when I viewed it with my Microscope, I discovered therein so many Coagulated Particles, even where the Liquid Matter had run off of the Glass, that it was hardly to be conceived how there could proceed, out of two transparent mixed Liquors, so many Particles, which through the Microscope appeared of the Colour of the Bark *China China*, besides an unspeakable number of such exceeding small Particles, that they almost escaped my sight, tho' viewed through one of the best Microscopes ; and about the space of a Minute after, in the place where the Liquid Matter had lain hinneft, I saw a great many Coagulated Salts of Quadrilateral Figures, the sides of which run obliquely into a Point, in appearance like a Quadrilateral pointed Diamond ; others were Coagulated without any Shape or Order, and all incompass'd with small Particles mentioned before : I saw moreover, a great many very transparent irregular Particles coagulated, of which, in all my Observations upon the Pickles and Brandy, I had never seen so many and so large ; in viewing those Particles more narrowly, I found they were Salts that had not been able to Coagulate.

After this I took a little Brandy (about the Quantity of three or four Grains of Sand) in which some of the *China China* had been infused, but not in whole Pieces ; and I mixed the same with about a like Quantity of my Blood, which by the prick of a Needle I had drawn out of my Finger, and as quick as ever I cou'd placed it before my Microscope ; and then with great Amazement observed the Operation of this mingled Stuff, in which there was such a fermenting and running about of the Parts, that it is impossible for me to express it to you ;
and

and in these Commotions I observed, that most of the Globules of the Blood (which are the occasion of its ved-ness) were dissolved, and I judged that this fermentation lasted about a quarter of a Minute; and because it was very diverting, I repeated the Experiment several times.

Moreover I mixed my Blood with some *French Wine*, in which the Bark had been infused, but discover'd no such fermentation as I had observed before, but I could perceive in some few places the Globules of Blood Coagulated after such a manner, that it appeared like a very thin Membrane torn to pieces, and several very thin Fibres or Threads thereof lay about, such as I had never seen before; and I think I never saw so little Coagulation of the Globules of Blood when mingled with any Liquid as I perceived with this mixture, but when the Blood was dry, and where it had lain pretty thick, there it was so much Coagulated, that there could be no Globules any longer observed therein.

Now if we consider that our Stomachs deliver out such Juices as Coagulate the Common Salts which are in our Meat and Drink, and discharge them with the Excrements, 'tis possible that many more parts of the *China China* are dissolved in the Stomach, and such a Coagulation caused in the Chyle, that the Juices which go into our Bodies, have such an Affinity with the Serum of the Blood, as to hinder its Separation, and so keeps the Blood in such a Fluid state, that the Distemper which we call a Fever is thereby prevented.

You will pardon me for traspasing so far beyond the Bounds of my foregoing Observations, but we cannot but stand amazed when we see that a Codfish should have two, three, or four Haddocks in its Stomach, which according to the manner of all Fishes, they swallow down with the Head foremost, and which serve for their Food and Nourishment; and that not only the Flesh of those
Fishes,

Fishes, but also all the Bones of the Heads and Bodies, are so broken and dissolved, as to be turned all into Chyle, excepting those Parts that are discharged with the Excrements.

Now one cannot conceive, that the Bones of these Fishes should be dissolved by the Motion which the Stomach receives from the *Ledens gemysse* Parts, which are on the Head, and which we call Cheeks; but one must imagine, that there is a Juice in the Stomach of Fishes, that causes the Dissolution of the Bones; and if it be so in Fishes, why not likewise in Four-footed Beasts, and also in Birds.

Whilst I was writing this, my People were preparing two Turbots for my Dinner, the biggest of which was above a Foot long, and had in his Stomach a young Whiting (not yet consumed,) and which being longer than the Stomach it self, part of the Tail was turned up to the Head, the most part of which was Dissolved and Consumed, but the Body was as fresh and good as any that are brought into the Market.

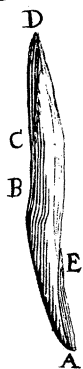
Having made these Remarks, and entred them into my Book, I writ the following to the *Heer Van Wikkhuysen*:

I think I have heard speak some Years ago of the China Chinæ, and been informed that this Medicine is not to be used but with the utmost Caution, for that otherwise it may be so prejudicial to the Body, that tho the Fever should be removed, the subsequent Inconveniences may be worse than the Disease it self; Wherefore you having had so much Experience of the China Chinæ, you cannot but know whether that Medicine does leave any Distemper behind it; of the truth of which I would gladly be informed.

Whereupon the said Gentleman answered me from Middleburg, July 15, as follows.

I know that many are of that Opinion, but what Grounds they have for it I can't tell; I must declare, that nothing of that has occurred in my Practice, and I have used as much of the Bark as any Body.

Fig: 1.



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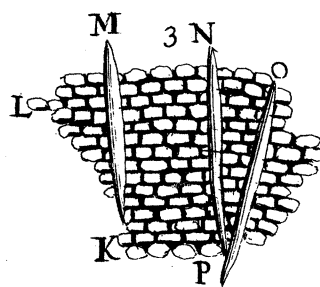
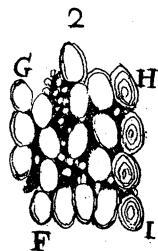
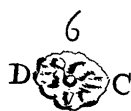
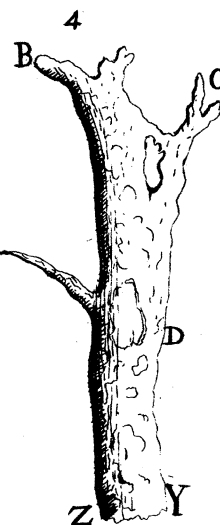
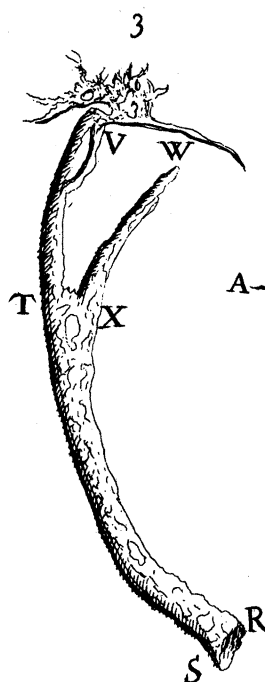
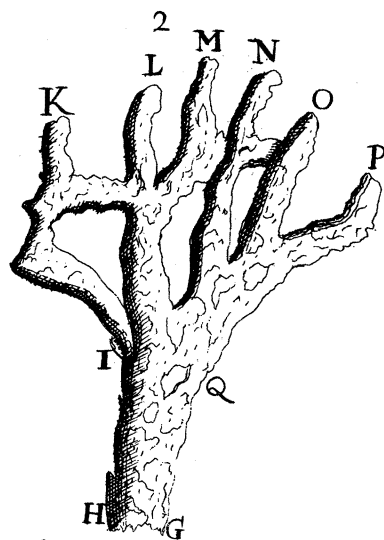
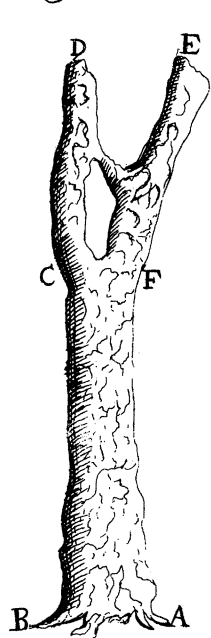


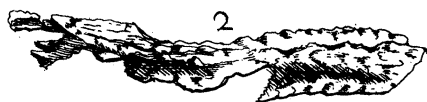
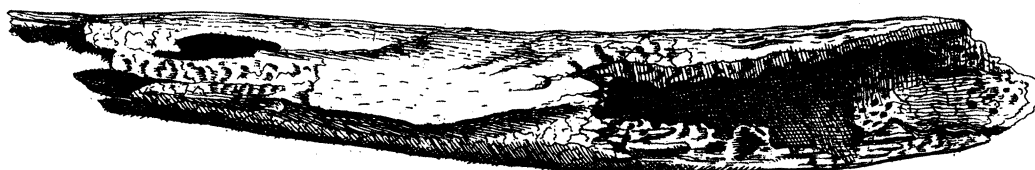
Fig: i:

Tab: 2:



Tab: 3.

Fig: I:



II. *A Letter to the Royal Society, from Mr. Anthony Van Leeuwenhoek, F. R. S. Concerning the Whiteness on the Tongue in Fevers, &c.*

Delft, Octob. 18. 1707.

I Have been long of Opinion, that our Tongue is of such a Form, that when it is found and of good Condition, it does not only communicate to the Body whatever is agreeable to it self, but also admits one part of the Matter that lies upon it, into the Manifold Vessels of which it is composed ; insomuch that by the Veins it's communicated to the Heart, and serves for Nourishment to the Body, and strengthening of a well Constituted Tongue.

It so happened, that in the beginning of last September I was seized by a violent Fever, which however lasted but three days with me ; upon the Fourth day I viewed my Tongue with a Magnifying Looking-Glass, and observed, that it was all over covered with Whiteness, only about a Fingers Breadth of the Tip was of its Natural Colour ; this Whiteness is judged by most People to proceed out of the Stomach or Bowels, by the Swelling of the Guts, or else from a sharp Humour out of the Head.

Perceiving my Tongue thus all over White, I scraped off a little with a Penknife, and placed it before a Microscope, and presently judged, that those that call this White Matter in our Language *Beſlagentſijt*, and so publish it in their Books, are much mistaken, for that which truly bears that Name must be something from without, and not any Matter protruded from the Body.

Now

Now that this abovemention'd White Matter has no Analogy or Agreement with that which is coagulated upon the Tongue from without, but that it is certainly protruded out of the Tongue, appear'd to me very plainly, when I view'd it with my Microscope, for I could then observe, that it was not only closely united to the Tongue, but that it was also forced out of it, just as Plants proceed from the Earth; yea, that it extended it self into Boughs and Branches.

Now for the better understanding of the said protruded Matter from the Tongue, I plac'd some of it before a Microscope, and caused it to be painted, after having separated the Parts from one another, which I often found clung together.

Tab. 2. Fig. 1. A B C D E F represents one of the said small Parts which I had scraped from my Tongue; A B shews where it was fastned to my Tongue, and C F shews how the Body of it divided it self into two Branches, described by C D and F E.

I have observed several times in the aforesaid Trunk or Body of that Particle a long Fibre or Streak running perpendicularly thro' the middle of it, which I imagined to be a sort of a Vein or Vessel from which the whole Body or Branches received their Nourishment; but as soon as that White Matter becomes dry, one sees no more of those Fibres in it.

Fig. 2. G H I K L M N O P Q represents a second Particle, which I had taken from my Tongue, of which G H I Q is the Stalk or Root, and K L M N O P the six several Branches, all which were at G H united to, or rather riveted in the Tongue.

Fig. 3. R S T V W X was a third Particle protruded out of my Tongue, and at T X you see the place where it divided it self into two Branches, which Branches are divided by T V and X W; and the Painter having observed at V some further sproutings out, he has described

them according as they appeared to him, but I my self have observed such out Sproutings as look'd like Flowers ; and whereas my Fever had left me about a day or two before I scraped off that White Matter from my Tongue, I imagined that the extreame parts of the afore-said Matter were almost worn or rubbed off when I made that Observation.

Fig. 4. Y Z A B C D was a fourth Particle of the protruded Matter from my Tongue, of which the greatest part of the Branches were, in a manner, worn or broken off, as you may see by A B C.

There was so much to be observed in all these Particles which I had scraped from my Tongue, that it was impossible for any Painter to describe them ; they seem'd outwardly to be Convex, and withal as transparent as Chrystal ; that is to say, at the very time I took them from my Tongue and view'd them with a Microscope ; but when they were dry they did not appear so neat, which was occasion'd by the Slimy or Glutinous Matter which we have always in our Mouths, and which makes these Particles cleave together.

That I might free them from the afore-said Glutinous Matter or Spittle, I put them into a little Rain Water, and stir'd it gently about, to the end that the said Matter might be diluted and united to the Water ; this being done I took some of those Particles, which by their weight had subsided to the bottom, and placed them before a Microscope.

I observed also with Wonder, how very strongly they were fastned to my Tongue when I scraped them from it, and that tho' I had let them lie eight days in Water, they were as strong as when they were first taken off.

Now how can we conceive the Common Opinion of some Doctors and Chymists, who maintain, that this Whiteness upon the Tongue is occasioned by the ascend-
ing

ing Vapours and Fumes from the Stomach ; whereas, as I imagine, that part of the Stomach which receives the Vi&uals is always shut, except when it discharges it self of Wind, which comes out by the Throat ; and how can the Fumes come out of the Head and descend upon the Tongue, as they also maintain, just as if our Heads were of the shape and make of the Helm or Head of a Still.

Might we not better resolve it thus ; That our Tongues are so constituted, as to receive a few of those Juices into the Orifices of its Vessels, and that this causes the Sensation which we call Taste, and that these Juices are carried or press'd by the little Coats or Tunica's of the small Veins that are in the Tongue, and so continued by the great Vein to the Heart ; but when we're indisposed with a Fever, the Whiteness which at that time appears upon the Tongue is occasion'd by the Blood being so thick, that it can't be carry'd (as it ought to be) thro' the small Vessels, and by the Expulsion or driving back of that Moisture in the Blood, which we call *Serum*.

Now the Tongue being thus cover'd with that White Matter that is protruded out of its Vessels, is incapable of admitting any of its Juices into it, and this is the reason that at such times we have little or no Taste.

Moreover there lay about that Matter which has been described by *Fig. 1, 2, 3, 4*, a vast Number of little Scales, with which our Mouth is all cover'd over within ; and the Painter having observed two such Scales that lay partly upon one another, he drew them, as you may see in *Fig. 5*, between A and B, and below them there lay another single Scale, which is described by *Fig. 6. C D*.

Now since we observe so many of these little Scales to fall off of their own accord from the Mouth, may we not well conclude, that in a strong Fever, such Scales receive Nourishment.

We also observed, that a great many of these Scales had a round Bubble in the middle of them, and that there was seldom in one Scale two Bubbles, as in *Fig. 5.* in that Scale which is represented by B ; I thought with my self, whether this might not be the place from whence the Scales received their Nourishment.

Fig. 6. Does likewise represent a Scale between C and D with a round Bubble in it. You may remember I told you above, that I could observe none of this White Matter upon the Tip of my Tongue ; the Cause of which, perhaps was the great heat of the Liquor I then made use of ; for as soon as I found my self in a Fever, I ordered some Coffee to be made for me, and drank four Dishes of it as fast as I could one after the other, inso-much that my Lips were very sore with the heat of it the day after ; the drinking of this Coffee gave me great ease, and the next Morning I drank some *Bohea* Tea, as fast as ever I could, in order to put my self into a Sweat, but in vain ; now 'tis possible that the heat of the Coffee and the Tea had dissolved, or loosened the White Stuff upon the Tip of my Tongue, which is to be enquired into.

I have said before, that upon the fourth day of my Fever I first viewed my Tongue and the White Matter I scraped from it, which was the same Day my Fever left me ; and I imagine that about that time a great deal of the White Matter, that had been about my Tongue, was fallen off, and that had I viewed the same the second Day of my Fever, I should have seen that Matter and the Branches of it much more plainly.

In the Month of *October*, it was reported in my House, that there was a young Man so grievously troubled with the *Thrush*, that they were afraid it would have killed him, for he could scarcely draw his Breath ; having inform'd my self who was his Doctor, I sent to him and desired him to let me have a little of that Stuff which was taken from the Tongue of the Patient, which accordingly

cordingly was brought to me two Days after one another.

This Matter, which lay upon a Paper, stuck so fast together, that it was very difficult to separate it, and the most part of it appeared as clear as any Water to our naked Eye ; having view'd it thro' a Microscope, I saw that the clear sticking Moisture was encompass'd with an exceeding great number of very small Globules, which appeared to me to be much smaller than those that make our Blood Red ; and when this White Matter was thorough dry, it appeared to be of a Green Colour, much like that Matter which we discharge by the Mouth when we catch cold, and which is commonly called Green Phlegm.

The Doctor told me, that a Day or two before, there peeled off whole Skins from the Tongue of his Patient, whereupon I asked him, Whether his Tongue was not very much swell'd ? To which he answered, It filled the whole Mouth.

I observed moreover in the said Matter, whether I view'd it wet or dry, such a great number of small Fibres, just as if it had been a thin Membrane that I had placed before the Glass.

I said to the Doctor, how much those Persons were mistaken that affirm that these Skins upon the Tongues proceed from the Vapours or Fumes of the Stomach, in which the Doctor agreed with me ; but when I told him that the great thickness of the Tongue was occasioned by the want of the Blood circulating therein, whilst the Heart was continually sending up fresh Blood into the Tongue, by which means it was forc'd thro' the Tunica's of the Vessels, and turn'd to that Matter which was found upon the Tongue, and which we call the Trush ; and whereas that Matter which I found in my Illness upon my Tongue was nothing but the *Serum* of the Blood, the reason of that was, That the Protrusion of the Blood was not so strong

strong in me, as it was in the Young Man, neither were there any Globules to be observed in it; I say when I told the Doctor this, he seemed to differ from me at first, but afterwards he agreed with me entirely in this Opinion; to wit, that the Matter, which was found upon the Tongue, does not proceed from Fumes and Vapours out of the Stomach, but is protruded out of the Tongue; and added moreover, that when he scraped such like Matter from the Tongues of his Patients, in half an Hours time they were covered again with the Matter which we call the *Thrush*; and further, that when the Patient being something better had scraped off the Matter upon the Tip of the Tongue somewhat too harshly, he caused his Tongue to bleed, but soon after it had done Bleeding, 'twas again covered with the *Thrush*.

III. *Part of a Letter from Dr. Scipio des-Moulins, to Dr. Hans Sloane, R. S. Secr. concerning a Mineral Water at Canterbury.*

ABout twelve Years ago a Mineral Water was accidentally detected in this City. In digging the Ground, they first met with a fat black Mold extending it self three Foot deep, and gradually changing into another sort of Earth, very fat and like Butter. This second Lay was two Foot thick; the Colour of it Yellow, something mixt; it's Odour strong and Mineral; and a piece of it, being for some time expos'd to the Sun, smell'd much like burning Sulphur. After this they found a Quicksand of a darker Colour than the first Earth, mix'd with several little Stones, and the Smell still stronger than before. Two
Foot

Foot further, under the Quickſand, a hard Rock appear'd, out of which Water gush'd with ſome Violence. They dug two Wells at about 7 Feet diſtance from each other; one about eight or nine Feet deep from its Surface, and twelve from the Surface of the Ground about it, and reacheth the Rock: T'other is not ſo deep by two Foot, and only toucheth the Sand. This laſt is ſomething ſtronger of the Sulphur, but the other is ſtronger of the Mineral Spirit and ferruginous parts.

Two Drams of the ſecond Lay of Earth, found in digging, being put into four Ounces of Spirit of Vinegar, there preſently aroſe a conſiderable Ebullition; and ſoon after the Spirit was ting'd with a yellow browniſh Colour, which ſuffer'd no alteration with the Infuſion of Logwood, nor with Galls, but with Oyl of *Tart. p. deliq.* turn'd greeniſh, and with the Infuſion of *Lig. neph.* of a pale red.

The Water taken up at the Spring is extraordinary limpid, but grows ſomething whitish in a quarter of an Hour, and in half an Hour the Spirit is loſt and the Mineral hangs fiſt on the ſides of the Glaſs, and then falls gradually to the Bottom. It won't keep quite ſo well as the *Span* or *Tunbridge* Water. Its Taſte is maſculine and auſtere; the Smell ferruginous and ſtrong, ſomething upon the Sulphur: People ſay it ſmells like Gunpowder. It will make the Root of the Tongue of the Drinkers look blackiſh. Linnen waſh'd in it turns yellow. It will not lather with Soap. The Glaſſes the Water is dip'd with grow yellow, which no ſcowering can take off, and are apt to fly. In froſty and cold Weather, it is ſo warm as to melt Ice and Snow; in other Seaſons it's cold, though not ſo cold as ſome Spring Waters are.

The weight of this Water varies much according to the Seaſons and Weather. In *May 1704*, it weigh'd three Grains lighter than Common Water in the quantity of a Pound. In the Spring of *1705*, it was equal in weight

Common Water ; and is now still heavier in *August* following, because of the exceeding dry Weather of that Summer. But in general about Midsummer, if the Weather is no ways extraordinary, it's pretty equal to common Water in weight.

A single Grain weight of good Gall will turn a Pint and a half of this Water of a very noble deep red, and in an instant. Syrup of Violets turns it of a Grass green. With the Infusion of Brasile it giveth a deep lively Blue : With that of *Lign. neph.* first a light Green, then a light Yellow, with a Blue Crown : With the Infusion of Logwood, a blue Black : With that of Fustick Wood, a dusky Yellow : With the Flowers of Pomgranates, a fair Violet : With Leaves of Thea, a fine purplish Blue : With good *Nants* Brandy, an Elegant Sky-colour. It turns a Solution of the *Sacch. Saturn.* Milky in an Instant ; and the Solution of Sublimate in some time longer. *Ol. tart. per deliq. sp. Sal. Armon. sp. Vit. &c.* make no sensible alteration.

In Calm Weather, in Winter especially, a thick oily Film covers the surface of these Waters, of as great a variety of Colours as a Rainbow ; a Spoonful of it drunk, hath the effect of, and composeth as much to Sleep, as a moderate Dose of Opium. Some of this Scum, being dried by Evaporation, tasted very fat, and felt so between the Fingers. Some of this Powder being cast upon a red-hot Iron, most of it immediately burn'd away with some sparkling ; and what remain'd was of the Colour of Rust of Iron, and tasted partly Stiptick and Earthy, and partly Saltilish.

The Water it self, being gently evaporated, yields a Yellowish Sediment, more or less, according to the Seasons. Last Spring a Quart yielded six Grains of it ; but in *September* following, the same Quantity afforded me nine Grains ; whereas a Pound of *Tunbridge* Water gave but one single Grain of Sediment to Mr. *Boyle*, as appears
by

by his *Memoirs of Mineral Waters*. This Sediment being boil'd in common Water, made a strong *Lixivium*, with which Acids caus'd no sensible Fermentation ; but Syrup of Violets turn'd it Green. This *Lixivium* being evaporated, yielded a fat Sulphurous Salt, that would not coagulate into Crystals. I can get but three or four Grains of it out of ten Grains of Sediment ; but from the Colour and Taste of the *Lixivium*, I have reason to suspect, that there is a larger proportion of Saline Particles, which, as I conceive, being Volatile, evaporate away with the Water. These are some of the most material Experiments I have made upon these Waters.

As for their Medicinal Virtues, I might say a great deal, but hoping to enlarge upon it another time, I shall only tell you, Sir, that from the many and truly wonderful Cures, I believe it to be one of the most excellent Waters of this kind, as yet found out in *England*. The little Well is very useful in Diseases of the Breast, as in *Asthma's*, Coughs, Rheums and Catarhs. It hath cured several given over of Consumptions of the Lungs. Most Disorders of the Stomach are cured by this Water. It seldom fails in the Cure of Rheumatick gouty Pains of the Limbs, or other Parts of the Body, in the Scurvy and Melancholy Distempers, Jaundice, Vapours, all sorts of Stoppages, Scabs, Itch, &c. But in Gravel, Cholick, and Greenickness, 'tis a true Specifick, as also in inward Ulcers, if not too far gone. A Potter of *Bolton*, who had spent his Substance in Doctors, and was last Spring discharged out of *St. Thomas's Hospital*, as an Incurable Person, hath been cured of his Ulcer in the Bladder this Summer, with drinking of this Water for three Months together.

In Agues it is beyond the Bark : I have seen some Rebellious ones, that could not be removed by the Bark, perfectly cured by this Water, and some Constitutions quite worn out by the frequent Relapses of this Distemper, re-

stored again. This is also remarkable, that it agrees best with old, decay'd, and weak Constitutions. The Water sets pleasantly upon the Stomach, works off by Urine very briskly, causeth a good Appetite, cheers the Spirits, and procures Sleep. It is not binding, as some other Chalybeats are, but keeps the Body open to most People, and upon some it brings now and then a gentle Looseness, which carries off the Distemper. For these four Years I have prescrib'd 'em to many Scores of People every Season, and I could never observe any inconveniency, or ill Symptom arise from the Drinking of 'em.

IV. *An Account of the Cure of two Sinuous Ulcers possessing the space of the whole Arm, with an Extraordinary Supply of a Callus which fully answers the Purposes of the Os Humeri lost in time of Cure. From Mr. John Fawler, Surgeon to the Sick and Wounded at Deal, to Dr. William Cockburn, F. R. S.*

S I R,

YOU perswade me that it will be very acceptable to the *Royal Society*, to give them some Account of that troublesome Cure I spoke of to you, whereby these diligent Naturalists may be likewise furnish'd with an uncommon instance of the Power, as well as the Bounty of Nature, in providing against the loss of the Bone of the Arm with a Wonderful *Callus*.

The Case was of *John Marsh*, of the Parish of *Denton* in the County of *Kent*; he was about 16 Years Old. This young Man was troubled with a Tumour on his Arm
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in the end of a continual Fever, which seems to be a Critical Discharge of the Humour of the Fever on his Arm : he was manag'd by a Surgeon of that Parish two Years together for this Tumour ; at length, there being no appearance of a Cure, he was sent to me. At first dressing I found two Sinuous Ulcers in his Right Arm, one upwards about the *Deltoid Muscle*, and the other on the under part of his Arm, within an Inch and a half of the Juncture of the *Cubitus* ; the *Sinus* above passing upwards within an Inch and a half of the Juncture, and downwards to the *Cubitus*. The *Sinus* of the lower part pass'd downwards to the *Cubitus*, and upwards about an Inch and a half. When both these *Sinus* were laid open, the Bone soon show'd it self carious and loose, so that I easily took it out, and was about five Inches long. [See *Tab. 3. Fig. 1.*]

Three Weeks after there came off another Spelt of Bone of the inner side, about two Inches long, having the Channel of the Marrow. [*Fig. 2.*] These Ulcers, with much Care and Diligence, as every one skilful in such Cases must be sensible, were Cur'd very well in nine Months ; and the place of the Bone is so well supplied with a strong *Callus*, that he is not only very strong, but can lift 50 l. weight with that Arm.

V. *Part of a Letter from Richard Waller, Esq; S. R. S. to Dr. Hans Sloane, R. S. Secr. Concerning two Deaf Persons, who can speak and understand what is said to them by the Motion of the Lips.*

THERE live now, and have from their Birth in our Town, a Man and his Sister, each about 50 Years Old, neither of which have the least sense of Hearing; they both live by their daily Labour, yet both these Persons know by the motion of the Lips only, whatever is said to them, and will answer pertinently to the Question proposed to them of any thing within their Capacity, and are both very intelligent, as far as can be expected from their Education. I remember several Years since, Mr. Colson the Mathematical Master, coming to see me, this Man was then working in the Garden; and Mr. Colson and I standing close together, I took an opportunity when the Fellow look'd on me, to ask him some Question or other, which he readily understood, and answer'd according to it; tho Mr. Colson that stood by me heard me say nothing, the Fellow understanding it only by the motion of the Mouth, so that you need only Whisper, provided the Lips and Mouth be but moved as they ought, and you do not speak too fast. I many Years since inquired of his Mother, who has been long since dead, as to their Deafness; and she told me, they could Hear very well and Speak when they were Children, but both lost that Sense afterwards, which makes them retain their Speech: Tho that, to Persons not used

to them, is a little uncouth and odd, but intelligible enough, especially the Mans. They were not Twins; and I knew three Brothers of the same Parents, that had their Hearing as well as any Persons whatever.

VI. *A Relation of a Deaf and Dumb Person, who recover'd his Speech and Hearing after a Violent Fever: With some other Medicinal and Chirurgical Observations. By Mr. Martin Martin.*

Daniel Frazer, a Native of Strathairn, some six Miles from Inverness, continued Deaf and Dumb from his Birth, till the seventeenth Year of his Age. The Countess of Crawford kept him in her Family for the space of eight or nine Years: After seventeen Years he was taken ill of a violent Fever, but being let Blood his Fever abated, and had not its Natural Course: About five or six Months after, he contracted a Fever again, and had no Blood drawn from him, and this went on with its Natural Course. Some Weeks after his recovery he perceived a motion in his Brain, which was very uneasy to him, and afterwards he began to Hear, and in process of time to understand Speech; this naturally dispos'd him to imitate others, and attempt to Speak: The Servants were much amaz'd to hear him, and some run away; he was not understood distinctly for the space of some Weeks; he is understood now tolerably well, tho he yet retains the *Highland* Accent, as *Highlanders* do who are advanc'd to his Years before they learn the *English* Tongue: he can speak no *Irish*, for it was in the *Low Lands* of *Scotland* that he first heard and spoke. He continues

to serve the Earl of *Crawford*. I left him at *Morpeth* the beginning of this Month of *August*, 1707.

When the Small-Pox is Epidemical in the Main Land over against *Skie-Isle* on the S. E. and East, and likewise in *Skie-Isle*, the Natives Bathe their Children in the Infusion of *Juniper* Wood, and they generally escape; whereas those who neglect this Precaution, are observed often to die: Of this I have seen several Instances.

The Plant *Water-lilly* being apply'd to the pain'd part of the Body where a *Felon* is fix'd, it is observed, that it forces its Passage quickly in that place through the Skin.

The red hot Iron is commonly used in piercing an Inch deep in Arms or Legs, and cures several Distempers.

A Wound or Scarification cross the Crown of the Head cures Fluxes and Dysenteries. The Blood being stanch'd, the Wound is cured as other Wounds commonly are.

Silverweed is used as *Hops* to brew Beer.

VII. *Observatio Eclipsis Lunaræ peracta Bostonij Nov.
Anglorum, die quinto Aprilis vespere, A. D. 1707.
a Tho. Brattle.*

Immerfiones.	Tempus ex		
	Alt.	correct.	
	H.	'	"
P Enumbra valdè notabilis	6	52	
Palus Maræotis tegitur	6	58	20
M. Porphyrites incipit	7	8	15
Tegitur	7	9	20
M. Ætna incipit	7	16	
Penitus tectus	7	17	15
M. Sinai incipit	7	21	40
Planè tectus	7	22	40
Infula Corfica tegitur	7	24	
Lacus niger major tegitur	7	31	40
Infula Besbicus	7	33	
Bizantium	7	36	30
M. Horminius	7	37	20
M. Apollonii	7	40	30
M. Hercules	7	44	30
M. Corax	7	51	30
Palus Mæotis incipit	7	52	45
Inful. Maj. in M. Caspio incipit	7	54	45
Tegitur	7	56	
Palus Mæotis omnino tegitur	7	57	30
Luna plena Immerfa	8	1	15

Emerfiones.

Emerfiones.		Tempus ex Alt. correct. H. ' "		
Comp. Alt. Arcturi	53° 34'	8	28	
	51 30½	8	39	15
Comp. Alt. stellæ quæ fequitur in corona feptentrionali	} Lucidum			
Lat. 44° 33'		9	0	30
	56 57	9	17	15
Luna Emergere planè incipit		9	46	30
M. Ætna tota illustrata		10	9	30
M. Sinai tota apparet		10	10	15
Infula Besbicus		10	25	
Bizantium		10	28	30
M. Apollonii		10	33	
M. Hercules		10	36	30
Palus Mæotis incipit		10	44	
Infula Major in M. Cafpio reftauratur		10	47	
Palus Mæotis tota reftecta		10	49	
Luna plenè illuminatur		10	54	

A N
I N D E X
T O
The Twentyfifth Volume
O F
Philosophical Transactions.

A.

AIR, its Pressure and Elasticity. See *Experiments*.
Aged People. No. 310. p. 2418. *John Bayles Aged*
130 Years. No. 306. p. 2247.
Anatomical Observations. A Large Tumour in the Neck,
containing a Bony Substance. No. 305. p. 2214. Stony
Bodies in the *Prostates* of an Old Man. No. 305. p. 2217.
The *Uterus* Schirrous. No. 305. p. 2218. Operation
of Cutting a Child out of the Womb. No. 307. p. 2301.
Hydatides inclosed with a Stony Crust in the Kidney
of a Sheep. No. 307. p. 2304. *Hydatides* in a Tumour
of the Neck. No. 308. p. 2344. A *Hydrops Ovarij*.
No. 308. p. 2317. Balls of Hair taken from the Ur-

The INDEX.

- rus* and *Ovaria*. No. 309. p. 2387. *Sinuous Ulcers* in the Arm. No. 312. p. 2466. Some things observable in the Anatomy of the Ear. No. 311. p. 2415. See further in *Dissections*.
- Animals*. *Quadrupeds* in the *Philippine Islands*. No. 305. p. 2197. at the *Cape of Good Hope*. No. 311. p. 2428. The *Pediculus Ceti* described. No. 308. p. 2314. *Animals* dissected. See *Dissections*.
- Antiquities*. A *British Fortification*. No. 310. p. 2420. *Roman Inscriptions* found at *York*. No. 305. p. 2194. *Roman Sudatory* at *Wroxeter* in *Shropshire*. No. 306. p. 2226. *Antiquity* of *Wroxeter*. No. 306. p. 2220. *Remarks* on the *Hypocausta* of the *Ancients*. No. 306. p. 2132.
- Atmosphere* round the *Moon*. N. 306. p. 2241, 2244.

B.

- Baths* in the *Philippine Islands* No. 311. p. 2408. *St George's Bath* by *Landeck* near *Silesia*. No. 308. p. 2346.
- Books*. See the end of this *Index*.
- British Fortification*. See *Antiquities*.

C.

- Monstrous Calf*. See *Monsters*.
- A *Callus* supplying the place of the *Os humeri*. No. 312. p. 2466.
- Cards*, their *Antiquity*, and that they gave the first Hint for *Printing*. No. 310. p. 2397.
- Cape of Good Hope* described. N. 310. p. 2423.
- China China*. See *Jesuit's Bark*.
- Rock Chrystal*, the *Figure* of its *Parts*. No. 311. p. 2428.
- Chrystalline Particles* of *Silver*. See *Silver*.
- Comets*. See *Meteors*.

D.

The INDEX.

D.

- Two Deaf and Dumb Persons** that understand what is said by the Motion of the Lips. No. 312. p. 2468.
- A Deaf and Dumb Person** that recover'd his Speech and Hearing after a Fever. No. 312. p. 2469.
- Diamonds**, their Figure, and that they do not increase. No. 311. p. 2425.
- Diseases.** *Gout*, the Method of Curing it. N. 310. p. 2435. *Jaundice* occasion'd by a Stone obstrueting the *Ductus communis biliaris*. No. 306. p. 2233. *Small-Pox* prevented by an Infusion of *Juniper-wood*. N. 312. p. 2470.
- Dissections.** Observations in the *Dissection* of Human Bodies. N. 307. p. 2283. *Dissection* of *John Bayles*, Aged 130 Years. N. 306. p. 2247. *Dissection* of a *Hare*. No. 307. p. 2302. *Dissection* of a *Mountain-Hen*. No. 307. p. 2303.

E.

- Eclipse of the Sun**, May 1. 1706. observed at *Greenwich*. No. 306. p. 2237. at *Canterbury*. No. 306. p. 2238. at *Horton* in *Yorkshire*. No. 306. p. 2239. at *Bern* in *Switzerland*, p. 2240. at *Geneva*, p. 2241. at *Marseilles*, p. 2244. at *Zuric*, p. 2246.
- Eclipse of the Moon** observed at *Zuric*, Apr. 17. 1707. No. 310. p. 2394. at *Boston* in *New-England*. No. 312. p. 2471.
- Experiments.** The Proportion of the Weight of *Air* to the Weight of the like Bulk of *Water*. No. 305. p. 2221. The Spontaneous Ascent of *Water* in small Tubes, is the same in *Vacuo*, as in open *Air*. No. 305. p. 2223. The Production of *Light* from the Attrition of the Hands on a *Glass Globe* exhausted of *Air*. No. 307. p. 2227. The Electricity of *Glass*. No. 308. p. 2327.

The INDEX.

The Attrition of *Glass*. No. 308. p. 2332. Light produced by the *Effluvia* of one *Glass* falling on another in motion. No. 310. p. 2313. The Quantity of *Air* produced from a certain Quantity of *Gunpowder*. N. 311. p. 2409. *Air* compressed requires time to recover its Natural State. N. 311. p. 2412. The Difficulty of separating two Hemispheres upon Injecting an Atmosphere of *Air* on their outward Surfaces. No. 310. p. 2415.

F.

Flea, Microscopical Observations on its Sting. No. 307. p. 2311.

G.

Glass produces Light by Attrition. N. 310. p. 2413. See more in *Experiments*.
Gunpowder, what Quantity of *Air* produced from it. No. 311. p. 2409.

H.

Balls of *Hair* found in the *Uterus*. No. 309. p. 2387.
Healthiness of the Parishes of *Kinardsey* and *Donington*. No. 310. p. 2418.
Hottentots, their Customs and Manner of Living. No. 310. p. 2424.
Hydatides. See *Anatomical Observations*.
Hypocausta. See *Antiquities*.

I.

Jaundice. See *Diseases*.
Jesuits Bark, the Figure of its Parts. No. 312. p. 2446.
Juniper.

The INDEX.

Juniper wood, an Infusion of it used to prevent the Small-Pox. No. 312. p. 2470.

L.

The ninth *Legion* resided at *York*. No. 305. p. 2914.

Light produced from Glass by Attrition. No. 310. p. 2413.

Light observed in the Heavens. See *Meteors*.

Lions, the manner of Killing them at the Cape of Good Hope. No. 311. p. 2430.

M.

Magnetical Needle, its Variation in the *Atlantick* and *Æthiopic* Oceans. No. 310 p. 2433.

Mathematical Matters. The Construction and Properties of a new *Quadratick* to the *Hyperbola*. No. 306. p. 2253.

The Resolution of *Cubic* and *Biquadratic* *Æquations*. No. 309. p. 2353. Analytical Resolution of *Æquations*, &c. No. 309. p. 2368. A Defence of D. *Gregorie's* *Mathematicks*. No. 308. p. 2336.

Meteors, A Glade of Light observed in the Heavens. No. 305 p. 2220. A Pyramidal Appearance in the Heavens. No. 310. p. 2411. Observations on the *Comet* that appeared at *Rome* 1664. No. 309. p. 2350.

Microscopical Observations on the Seeds of some *East-India* Plants. No. 305. p. 2205. on the Structure of the *Spleen*. No. 307. p. 2305. on the Sting of a *Flea*. No. 307. p. 2311. on the Salts of *Pearls* and *Oyster-shells*. No. 311. p. 2416. on the Particles of *Silver*, &c. No. 311. p. 2425. on the *Jesuits Bark*. No. 312. p. 2446. on the *Thrush* in Fevers. No. 312. p. 2456.

Minerals in the *Philippine* Islands. No. 311. p. 2404.

Mineral Waters. See *Waters*.

Monsters in the *Philippine* Islands described. No. 307. p. 2266. *Monstrous* Human Birth. No. 308. p. 2345.

Monstrous Calf. No. 311. 2414. *Moon*.

The INDEX.

Moon. See *Eclipse* of the Moon.

Atmosphere round the Moon. See *Atmosphere.*

N.

Natural History. See *Books.*

Natural Observations in *Kinardsey* and *Donington.* No. 310. p. 2418.

O.

Old Age. See *Aged People.*

Oyster-shells, the Figure of their Parts, and that they are of no use in Physick. No. 311. p. 2422.

P.

Pearls, the Figure of their Salts. No. 311. p. 2417. not dissoluble by the Stomach. p. 2420. of no use in Physick. p. 2421.

Pediculus Cæti. See *Animals.*

Printing, its first Invention, Progress, and Improvement. No. 310. p. 2397.

Q.

Quadratrix to the *Hyperbola.* No. 306. p. 2253.

Quadrupeds. See *Animals.*

R.

Storm of *Rain* at *Denbigh.* No. 308. p. 2342. The Quantity of *Rain* that fell in the Year 1705. No. 309. p. 2378.

Roman Inscriptions. See *Antiquities.*

Royal Oak, an Inscription on the Wall that incloses it. No. 310. p. 2422.

S.

The INDEX.

S.

Salt, how made at the *Cape of Good Hope*. No. 310.

p. 2433.

Salts of Pearls, Oyſter ſhells, &c. See *Microſcopical Observations*.

Serpents of the *Philippine* Iſlands. No. 307. p. 2274.

Seeds of ſome *East-India* Plants and their Virtues. No. 305.

p. 2205.

Fossil ſhells near *Mears-Aſhby* in *Northamptonſhire*. No. 305.

p. 2210. *Shells* in the *Philippine* Iſlands. No. 311.

p. 2397.

Silver, the Figure of its Salts. No. 311. p. 2425.

Spleen, the Structure of its Parts. No. 307. p. 2305.

Stone obſtructing the Gall-Veſſels. No. 306. p. 2233.

Storm of Rain. See *Rain*.

Sun. See *Eclipse*.

T.

Thruſh. See *Whitneſs* on the Tongue in Fevers.

Tyger, a remarkable inſtance of their *Fierceneſs*. N. 310.

p. 2431.

Types for Printing firſt invented. No. 310. p. 2399.

U.

Ulcers in the Arm. No. 312. p. 2466.

Uterus Schirrous. See *Anatomical Observations*.

W.

An Eruption of *Waters* in *Craven*. No. 306. p. 2236.

A Mineral *Water* at *Canterbury*. No. 312. p. 2462.

A Table of the *Weather*, *Winds*, &c. for the Year 1705.

No. 309. p. 2378.

Whitneſs of the Tongue in Fevers. No. 312. p. 1456.

BOOKS,

The INDEX.

BOOKS,

Of which some Account is given in these *Transactions*.

Account of Mr. *Bagford's* Collections for the History of Printing. No. 310. p. 2407.

Account of Mr. *Morton's* Progress in the Natural History of *Northamptonshire*. No. 305. p. 2213.

Manuscripts left by the late Reverend Mr. *John Ray*. No. 307. p. 2282.

Second Volume of Sir *Rob. Sibbald's Prodrromus Historiæ Naturalis Scotiæ* preparing for the Press. No. 308. p. 2314.

Vindiciæ Matheſeos Universalis Gregorianæ contra ſecundos Abbatis Galloſij impetus, &c. No. 308. p. 2336.

De Arthritide Anomala, ſive Interna, Diſſertatio. Authore Guil. Muſgrave, M. D. No. 310. p. 2435.

Archæologia Britannica. Vol. I. By *Edw. Lhuyd*, M. A. No. 311. 2438.

A Treatiſe of *St. George's Bath* by *Landeck*, in the Lordſhip of *Glatz*, near *Sileſia*. By *Dr. Ehm*. No. 308. p. 2346.

Samuelis Dale Pharmacologiæ ſeu Manuductionis ad Materiam Medicam Supplementum. No. 306. p. 2253.

The Natural Hiſtory of *Jamaica*. Vol. I. By *Dr. Hans Sloane*. No. 311. p. 2433.

The Whole Art of Huſbandry. By *F. M. Eſq;* No. 310. p. 2442.

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M DCC VIII.